NEW ZEALAND'S LEADING COMPUTER MAGAZINE

BITS & BYTES

May 1986: $2.25

CATALOGUE PC86

Reviews

Sporty Compaq Portable II
Tidy Kaypro 2000
Zappy Fastback
Whiz-bang MindProber
Multifarious Pick

Columns Insider's business. All-in-1 accounting. DIY Basic. Pascal II. Apple files. Amstrad programming. BBC teletext. Atari spreadsheet. Spectravideo cleverness. Spectrum buying. Commodore print. And much more ...

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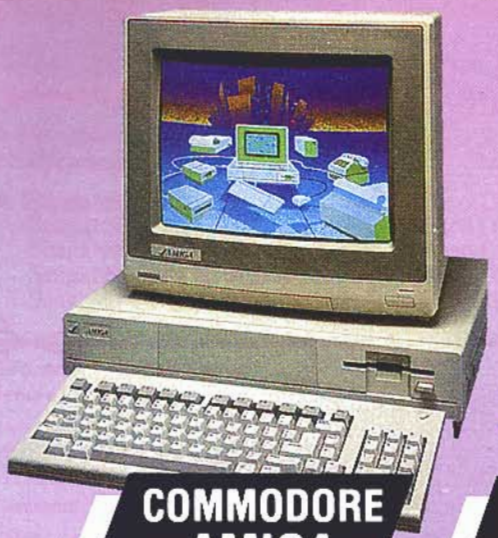

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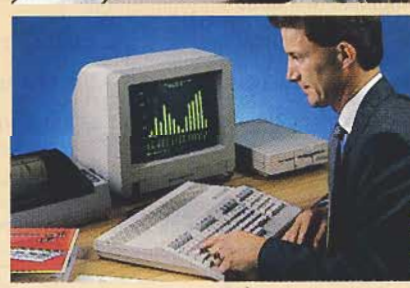

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Amiga launch at PC86

Commodore NZ is to give its resurgence extra impetus at PC86 where it is launching the Amiga into NZ.

The Amiga package, with 512K RAM, an inbuilt 3½-inch drive, mouse and colour monitor is to cost $3995 – a price low enough to cause a stir among more than just the enthusiasts.

It significantly undercuts the Macintosh and is on a par with IBM compatibles currently being favoured by the business market.

Commodore's next step will be to prove how this new generation of computer can enhance business applications.

The immediate problem is landing enough software to support the Amiga, which has reportedly been selling fast in the US and sucking what software there has become available.

A current list of Amiga software, published in the March issue of AmigaWorld, shows most of the 67 titles becoming available during the first quarter of 1986 in the US.

The list is encouraging for those considering an Amiga purchase because it features a full range of business applications, such as the VIP modules for spreadsheeting and project planning, and entertainment, such as the Adventure Construction Set.

Commodore's future seems to hinge on the success of the Amiga as it recently held off US$192m of loan defaults by arranging further credit facilities (of US$135m) through to March of next year.

Paxus spin-off

Two recent spin-offs of Paxus are Darton Holdings, trading as Phoenix Software, and Southmark Electronics.

Phoenix is Paxus' former Unix development team, which is continuing with the development of an accounting package of modules called Maestro. The team's continued involvement however is under contract rather than as employees of IAL (Paxus).

Maestro is almost ready for its market release. Its marketing will behandled still by Paxus.

Meanwhile Southmark has been bought from the Paixus group by former Paxus Commercial systems employee Stewart Finlayson and Peter Uffindall, formerly with Data General as a product manager.

Southmark continues trading as an IBM dealer, and distributing Techmar add-ons and Toshiba printers.

CDL stripped

Computer Distributors Ltd has been stripped of assets, and of stocks of Spectravideo computers, and been set to one side by Consolidated Enterprises as it concentrates on its remaining computer distribution subsidiary, CED Distributors Ltd.

CED reports a boost in sales so far this year of Apple micros, particularly of the $6,500 Mac Plus which at long last has apparently taken the Macintosh into the NZ business market.

A link between CED and Businessworld, the IBM dealership chain, is believed to be under negotiation – Businessworld possibly becoming a dealer of both IBM and Apple products.

Spectavideo servicing has been taken over by Hitech Services in Auckland, while significant stock went to South Auckland Computers Ltd, a retailer.

Testing

The local market for pirated or "bootlegged" copies of popular software, such as Lotus 1-2-3, was being "tested" by a PC clone distributor in Auckland.

Metron Holdings manager Barry Barnes says his advertising of "DBase III" for less than $80 was "to see what moralistic reaction I would get from dealers and licensed distributors".

The response, he claims, was an avalanche of dealer inquiries, and stern threats of litigation from Brimaur and franchised distributors (wholesalers) of Microsoft, Ashton-Tate and other well-known brands of software.

"I could have taken close to $60,000 of orders within the first 24 hours of the advertisement appearing – but I didn't because it was only a test," says Barnes.

The advertisement, he said, was a post-script tacked to his regular mail-out to dealers.

The conclusion of his test? "No one is going to be moralistic about $1500 for a programme when you could buy it for $50 – no one, excepting the franchisees distributing the $1500 products."

Barnes claims such copies of software were already being imported directly for personal use and for resale – the main cost being in reprints of accompanying documentation – and the few copies imported by himself were only for personal use.

Metron sells IBM compatible Inforstar PCs.

Attache Chpt II

Attache Software has filed a "chapter II" in the US, meaning it has no funds left to continue trading.

Meanwhile it has reverted to becoming an Australian-based company with its NZ subsidiary continuing to operate as usual.

The Australian "management buyback" will enable cost savings and will end remittances to the US base, says Attache's NZ manager, Bill Henderson.

He said the US downfall was attributable to the cost of pursueing a vendor logo with IBM.

Rumour dept.

A widespread rumour that a certain computer importer is in conflict with Radio NZ and the Broadcasting Corporation appears to have little validity.

The corporation's information centre manager, Tony Bengree, says there is no conflict, and denied having problems with unreliable computer hardware.

Seeking support

Computerphone is to receive a marketing boost from ICL, which is seeking local software developers' support for the Motorola 68008-based terminal.

Videotex closes

Two major newspaper publishers in the US have closed down their videotex services.

The move sets back the clock on development of a mass communications market for electronic information services.

The newspaper groups, Times-Mirror and Knight-Ridder, closed their Gateway and Viewtron services which had respectively 3000 and 20,000 subscribers. The viewtron investment was US$50m.

There are initial difficulties in various types of computers being able to access the services, but the main reason for the closures was high operating losses due to advertising support not keeping pace with the growth of subscriber demands.

Fatter Amstrad...

Amstrad has launched in the UK a "fat" version of the PCW-8256 – the upgrade being the PCW-8512, having 512K of memory and two drives instead of one. The UK price for the PCW-8512 is $1425 (including VAT and the printer).

At first glance the extra money does not seem significant for an 8-bit design that can address only 64K at one time. But the second disdrive does make it a better buy than upgrading an 8256 – if you actually need two drives.

The New Zealand distributor of Amstrads, Grandstand Computers, is not planning to import the "fat" version because it considers local market demand being not significant.

Grandstand points out that there is little cost difference in installing a second drive as an option for the PCW-8256.

... and Atari

Meanwhile Atari's 512K 520ST has also been expanded, to 1 Mb of RAM and a built-in 720K disc drive. The 1040STF should have about 740K to Basic and 878K free for text (in ST Writer) because the operating system is now fixed in ROM and does not demand an overhead of RAM.

In the UK the 1040STF with mono screen is costing $2,280.

Another version of the 520ST comes without disc drive or monitor but plugs straight into a television set, and that costs $1140 in the UK.

There are more than 200 software titles for the Atari ST range, of which about 10 are word processors and 50 are games.

Canon sells Apples

This month Canon, the Japanese giant, began marketing Apple computers through its 1,000 office automation shops.

A GREAT SET OF WHEELS FOR YOUR PC

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They're both designed and built as computer printers – not hopeful extensions of typewriter technology.

For a dealer near you contact – CONTROL

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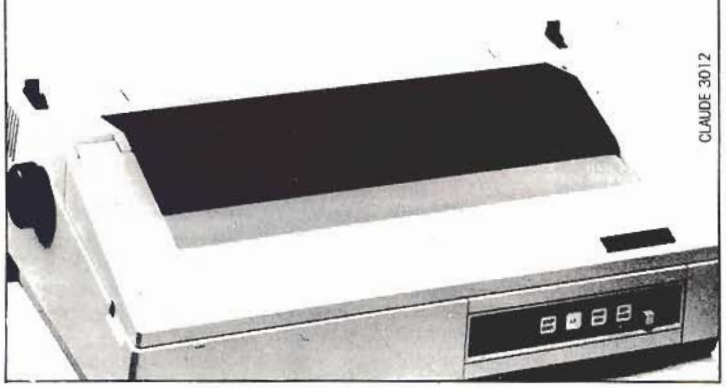

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No longer humble

So, what has been happening to the humble calculator?

Sharp has 80 models to choose from in this country, and the latest (costing $299) is the "new generation" kind, with 104 scientific functions, 26 memories, and recall of up to five years. It also handles 99 titled formulae in 1454 entry steps – and has a 24 dot-matrix display window, and optional printer.

Commodore write-off

Commodore Computer Corporation Ltd in New Zealand reports an unaudited tax-paid profit of $25,906 for the nine months to December 31, 1985.

The directors say this result was satisfactory in light of market conditions. As well, "significant provision" had been made for doubtful debts and obsolete stock.

They reported a retail downturn which saw some retailers going into receivership because of the sudden duty cuts on some audio and other household appliances.

Second venture

Following on from its joint-venture arrangement in China, Wellington-based Progeni has formed a joint-venture with GeoVision in Ottawa, Canada.

Progeni-GeoVision will focus on installing their own computer systems for the gathering, analysis and management of geographic-referenced information such as outside resources (gas lines), natural resources, surface features and service facilities.

New printers

IBM's new printer line-up now feature "dot band printing technology", meaning that the dots in dot-matrix print can be enlarged or reduced to present better quality without sacrificing speed.

Also available is the IBM Pageprinter which can print up to 12 pages a minute and offer 61 electronically stored fonts of letter-quality print.

Unix sites

A survey of Unix sellers and buyers by Arthur Hoby and Associates has resulted in an estimate of there being 782 Unix-based systems installed in this country.

Andas slimmer

Andas recently divested itself of various operations to become a leaner and more viable company, and it also appears to be dropping Apple computers.

Coincidentally, Olivetti Australia has resolved to establish itself here, with Andas to continue as a "non-exclusive Olivetti distributor".

Andas' NZ manager, Hugh Johnson, says it was premature to announce the direction of Andas' restructuring under Sydney-based Errol Williams, who had engineered the restructuring of CCL.

Regarding Apple, Johnson says Andas has not bought any Apple stock since February.

Racal communicates

Racal-Milgo has been awarded a data communications requirements contract by the US Postal Service, worth $46 million over five years.

Meanwhile Nippon Telegraph and Telephone, Japan's primary telecommunications provider, has placed a $13 million order for advanced data communications equipment, also from Racal-Milgo.

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Travel-tough and a 'real' screen

By John Lau

Most of you would have come across the popular Compaq range of personal computers advertised heavily in overseas magazines. Now, at last, they are available in New Zealand.

Compaq computers are IBM compatible but have been more popular than other compatibles because of high performance at low cost.

Reviewed here is a new version of their original portable, called Portable II.

The product family is available in three configurations (of disc drives and RAM) from NZ$8586 to $12069 (inclusive of tax).

The primary differentiating factor of the full function Portable II is its smaller size and lighter weight relative to other available tube-screen portables. It is barely twice the size of my brief case and lighter than a sewing machine.

Overseas, the price of the Portable II is some 20% cheaper than the original portable, with the added bonus of functional enhancements like more power and more speed.

The processor

The Compaq Portable II uses the 80286 processor, running at 8 Mhz (primary speed).

I can also run at 6 MHz to provide more compatiblity with the IBM AT.

On paper, operation at the primary speed provides you with a 33% gain in processing speed compared to the IBM AT. This is an important consideration when purchasing the machine for networking and multi-tasking environments. IBM's Top View is one that comes to mind.

Processor speed setting can be selected via one of the following: MS-DOS MODE command, jumper setting on the processor board, and the easiest of all, the keyboard's multiple key command – the sequence being CTRL ALT \.

Real time clock, battery and 80287 co-processor socket are all standard on the mother board.

CMOS memory

System memory and drive configuration details are stored in CMOS memory, along with the system date and time. CMOS memory replaces dip switches found on other computers for setting system configuration.

The battery in the system unit provides power to the CMOS memory for up to three years and you would not have to worry about it during power failure.

System configurations are established through the SETUP function of the Diagnostics Program, on a disc within the User's Guide manual.

The Portable II boots up quickly, and this is done without skipping memory checking.

I had my stopwatch on while it was formatting 360 Kbytes. I stopped it at 41 seconds, which is pretty fast.

Generally disk accesses are fast, and the same goes for spread sheet calculations and data base enquiries.

Display models

The monochrome monitor, to the left of the unit, is a high resolution dual mode monitor; dual mode in the sense that it can display both text and graphics so that you do not need a second monitor or graphics card. It has a medium persistence green phosphor screen.

The 9-inch screen is quite legible but not as crisp or sharp in the medium resolution graphics mode. We can blame IBM for that – with only a definition of 320 by 200 pixels, no wonder.

The high resolution fares slightly better with 640 by 200 pixels.

It is much better in the text mode where we have 720 by 350 pixels.

There are 16 levels of grey scale, a brightness adjustment knob on the front, situated just under the floppy disk drive,

COMPAQ PORTABLE II

as well as the usual 80 columns by 25 lines display for text.

The Portable II has a set-back common to portable computers, i.e. the display is usually below your eye level when you set the unit on desk tops.

I have to hunch my back to see the display. The other option is to reposition the unit with some thick books (computer manuals?) under the unit.

This particular display suffers from another irritating problem. It has a very slow decay time. It consistently takes between one to two seconds for the previous screen to completely disappear.

I find this unacceptable during graphic sessions.

The VDU (visual display unit) has no noticeable flickers, although I find it glares with noticeable intensity.

All these led me to test the unit's provision for external I/O (Input/Output) interfaces. I connected up my NEC RGB (red-green-blue) monitor and followed the instruction to enable (CTRL ALT <) it. I had no joy, I could not get it to work, and concluded that it is incompatible with NEC.

Keyboard

The keyboard is physically 43cm W by 3.3cm H by 17.5cm D and weighs 1.25 kilograms. It fits into the bottom of the unit, and is the base of the computer when you are carrying it around.

It is an 84-key, slightly modified IBM AT-styled keyboard.

Instead of the 10 function keys in two columns down the left side, they are ranged across the top in two groups of five and the keys themselves are smaller.

The two keys that are extremely large are the RETURN and SHIFT keys – you cannot miss them, and touch typists would be kept happy.

Green LEDs (light emiting diodes) indicators are on the NUM, SCROLL and CAPS lock keys.

The keys feel acceptable although they are not of the high tactile resistance type – there's not much rebounce after you hit the keys.

The speaker produces an audible click (adjustable) each time you hit a key.

But even the sound of the cooling fan drowned the "clicks" in a still and quiet environment.

The keyboard is attached to the CPU by a coiled cord – which proved awkward in packing back in its hole.

Disk drives

The floppy disk is of the 360 Kbytes type rather than the AT's 1.2 Mbytes. Thus you will have compatibility problems when you start bringing work home from the office's AT.

The IBM AT will have no problems reading 360 Kb disks, but I am afraid our Portable II will not be able to read disks written on the AT's drives.

It takes a little getting use to the floppy disk drive in the Portable II as it is recessed well into the face plate of the unit and has a flap-type latch for opening and closing the drive. You have to insert the disk right into the recess until it clicks and then close the flap.

The drive itself works beautifully; very quiet in operation.

The 10Mb drive sits above the floppy. It too is very quiet. Movement of the drive head goes unnoticed.

Drive A (floppy drive) is located on the bottom to provide for ample clearance of the shock mounting hardware required the hard disk drive.

Documentation

A Compaq User's Guide provides an overview of the computer's abilities and

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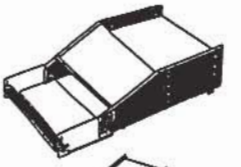

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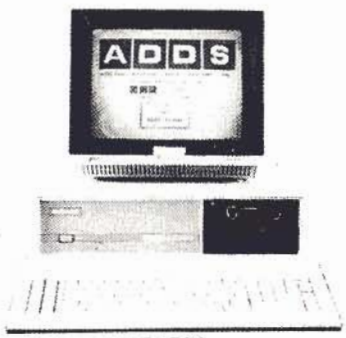

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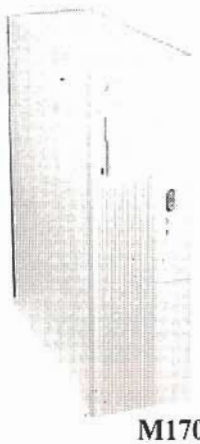

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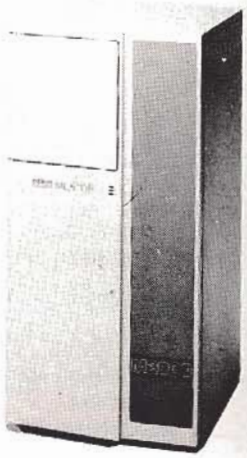

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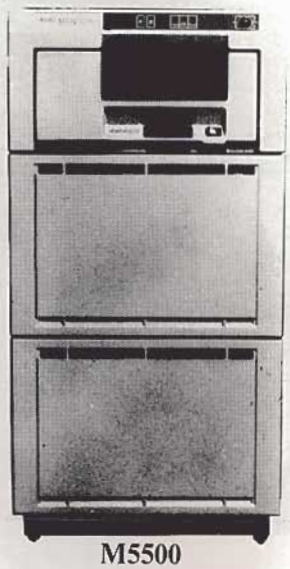

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Expansion	64 K	64 K	64 K	256 K	512 K	512 K
DISC CAPACITY						
Minimum Disc	720 K	10 MB	20 MB	26 MB	60 MB	167 MB
Maximum Disc	720 K	20 MB	40 MB	132 MB	300 MB	668 MB
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operation, and includes a Set-Up disc with manual of key commands and other operational requirements.

It is glossy, colourful and particularly well presented for first-time users.

The Portable II runs most, if not all, IBM PC/XT/AT software. I was provided with a 37 page booklet that lists all the programs that Compaq had tested to run on the machine.

One interesting option is the Automatic Power Switching board. This clever board enables the Portable II to operate on any electrical outlets around the world without an external transformer or setting a voltage switch – just the thing for globe-trotters. (The only setback is the various plugs used in different countries.)

There are four expansion slots hidden under a sliding door to the right rear of the unit, although the first two are already taken up by the printer and the RGB interfaces.

You can expand the RAM (Random Access Memory) up to 2.1 Mb without the use of an expansion slot. To upgrade a further 2 Mb only requires one expansion slot.

If you do that, then the last slot could be for networking, mainframe communications or perhaps another 10Mb in a card. ■

COMPAQ SUMMARY

Name:	COMPAQ PORTABLE II
Manufacturer:	Compaq Computer Corporation, USA
Components Processor:	16 bit 80286, 8MHz or 6MHz clock speed (program or keyboard selectable) Real time clock
Mass storage:	One 360 Kb 5 ¼ inch ⅓ height floppy disk drive One 10 Mb ½ height fixed disk drive
Memory:	640 Kb RAM expandable to 2.1 M on main board or 4.1 M with an expansion board
Display:	9 inch green monochrome dual mode-monitor high resolution text and graphics
Keyboard;	84 key modified IBM AT style QWERTY with 10 function keys. LED indictors on CAPS lock, NUM lock and SCROLL keys. Adjustable key clicks
I/O Interfaces:	RGB color monitor, RF modulator, composite video, parallel printer and asynchronous communications interfaces
Expansion:	Two slots
Operating System:	MS-DOS 3.1
Size:	45cm W x 19cm H x 35xm D 11.6kg
Software:	none supplied compatible with IBM PC/XT/AT
Options:	512/1536 Kb system memory board 512/2048 Kb memory expansion board Automatic power switching board (110 to 220 V) MS DOS/BASIC 3.1 and reference guide
Price:	$12,069 including tax $9,068 for a 256 Kb, two drive model $8,586 for a 256 Kb, single drive model

Review machine supplied by Scollay Computers, Wellington.

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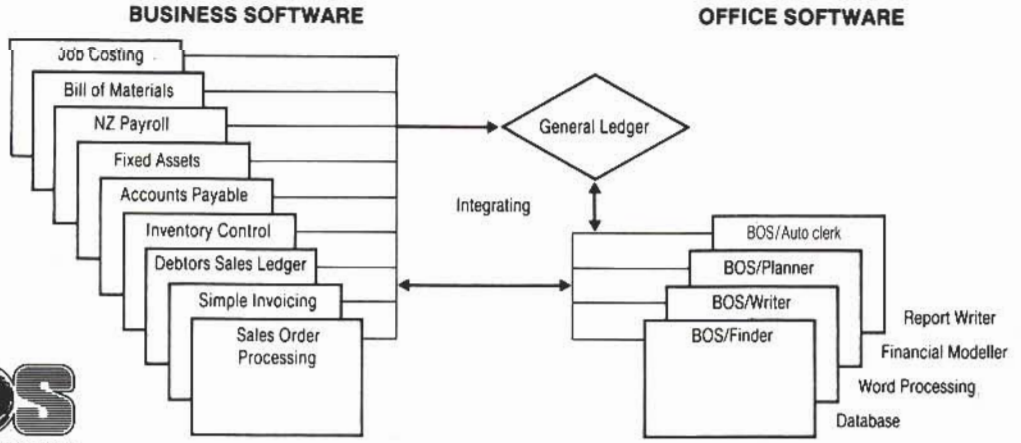

BUSINESS OPERATING SOFTWARE

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Another stylish LCD lap-top

Kaypro 2000

by Paul Left

The Kaypro 2000 is a recent entry into the portable IBM- compatible micro market. The market for such machines seems to lie mainly with business executives who might have to take their work with them wherever they go.

A briefcase-sized micro running MS-DOS software undoubtedly has more style and carries more status than a briefcase full of paper, and miniaturised equipment of any sort holds a great deal of fascination for many people.

Many children have access to easy-to-use, stimulating, and productive programs such as Newsroom or Print Shop, and adults are entitled to software tools of a similar standard.

This explains in part the popularity of memory-resident software, usually with a 'desk-top' theme, such as is supplied with this machine, and which is designed to provide a set of tools to enhance the work activities of the user.

Whether using a system like the Kaypro 2000 results in increased productivity or job-satisfaction depends to a large extent upon the tasks required of it, the user's work patterns, and the overall design of the computer and its software.

Thus, the best approach for a prospective purchaser is to talk with existing users of the same system. Nevertheless, this article aims to provide an objective look at the Kaypro 2000 package.

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With style

The machine arrives with a very stylish brushed aluminium case in dark grey and black, looking rather like a very small briefcase. Also included is a padded nylon shoulder bag.

The metal case gives the computer a more solid, substantial feel than the more usual plastic-cased machines, and care has obviously been taken with the design of the case.

Lift back the lid, and the machine runs through a test of its 256K of RAM, then attempts a boot of the built-in 3.5 inch disk drive.

The disk drives are moderately noisy, and some of the sounds are a little disconcerting at first.

The display is a 23cm by 7cm LCD screen, 25 lines of 80 characters, and a detachable keyboard familiar to users of IBM clones.

The overall impression is of a neatly-designed and compact layout, although the small plastic rod taped to the case behind the machine seems to be a hastily-added feature. This rod was the subject of some humorous conjecture until we found from the manual that it was necessary to reset the computer under some circumstances.

Desk-top view

Once DOS has booted, you have the option of loading one of two versions of a desk-top package before loading the applications software you're going to use.

The two versions are called Polywindows and Kdesk. Kdesk is a subset of Polywindows and uses less memory.

The software bundled with the machine includes Wordstar (of course!), Mailmerge, GWBASIC, Mite (communi-

cations software), Travelling Expense Manager, Correctstar, and Starindex.

The 3.5 inch disks have a capacity of 720K, so all this software, along with Polywindows, MS-DOS, and various utilities are supplied on just 3 disks.

When you boot one of these disks, you immediately enter a backup procedure. This helpful feature ensures that this important job is carried out as soon as the computer is first set up and not left until it's too late.

Polywindows is a desk-top package which includes a calculator, calendar and alarms, a sliding-tile puzzle, and a programmer's calculator which converts between binary, decimal, octal, and hexadecimal.

Other features are a communications package, a simple text editor, and a 'card-index' system for storing and retrieving brief notes and items of information.

Windows on-call

The desk-top you choose is loaded into memory before your application and called up at any time with a keystroke.

The larger program, Polywindows, takes a fair chunk of RAM; you can load Wordstar, for instance, but cannot then call up Correctstar to check your spelling with the desk-top in memory.

It's very easy to use, however, and it is nice to call up one function after the other, see the windows overlay across your Wordstar edit screen, and then remove them one by one and find your file still intact and the cursor waiting where you originally left it.

You can also move the windows around; if you don't like where the calculator appears on your screen, for instance, you can move it somewhere else.

I felt the windows package was the most appealing feature of the Kaypro 2000, along with the physical design of the machine.

Not quite clear

The main disadvantage, however, is that all this is not as pleasurable and as productive as it should be because everything on your screen is hard to read.

The LCD screen has 2 positions, the keyboard is detachable, and you can alter the contrast of the screen from the keyboard, but in spite of all this I found the display difficult to use over a period of time and conducive to eyestrain.

I never felt that the display was quite right and found myself constantly adjusting my position to try in vain to improve the legibility.

Still, you may feel this is a worthwhile price to pay for 35 lines of 80 columns in such a compact and portable package, and that the software with this machine is a good trade-off.

Lacks connections

There are several other features of the machine which I was not impressed with.

Firstly, there is no provision for connecting a standard monochrome monitor, which would provide a better trade-off between portability and legibility.

For some users, the ability to use the computer with a monitor in the office or home, and relying on the LCD screen only when 'on the road' could make the difference between a worthwhile purchase and an unproductive system. Personally, I would think twice about committing myself to a machine with a screen of this type and no possibility of adding a monitor.

My next complaint is that there is only an RS-232C serial connection for a printer. I hoped to give the machine a thorough test by writing this review on it, but without a parallel interface the file was doomed to never make it on to paper.

At present, the suppliers have only a daisy-wheel printer than can be used with the Kaypro, so there's no way you can print anything but text.

That means you couldn't get hardcopy of the 640 by 200 graphics available through BASIC.

Likewise, you couldn't print out graphs from software such as Lotus 123, even if you could get it on the 3.5 inch format.

Uncertain library

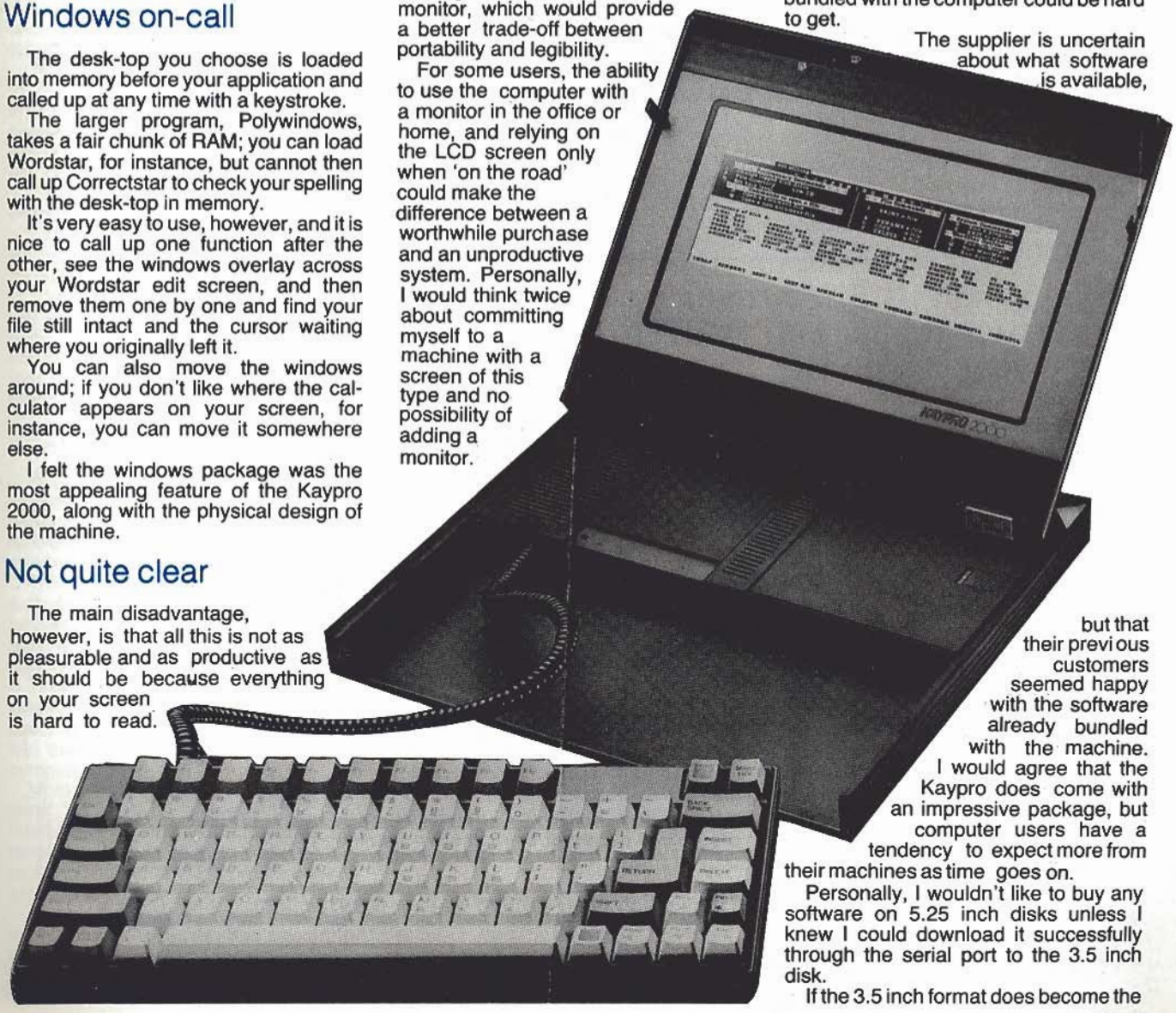
Which leads on to my next point, which is that software other than that bundled with the computer could be hard to get.

The supplier is uncertain about what software is available, but that their previous customers seemed happy with the software already bundled with the machine.

I would agree that the Kaypro does come with an impressive package, but computer users have a tendency to expect more from their machines as time goes on.

Personally, I wouldn't like to buy any software on 5.25 inch disks unless I knew I could download it successfully through the serial port to the 3.5 inch disk.

If the 3.5 inch format does become the



standard, however, as many people have been claiming it will, then the software shortage will not last.

Certainly the disks are convenient to use and have a nicely indestructible feel to them, and their storage capacity is impressive, but their predicted dominance in the market is not a certainty.

Expansion box

One future asset to the Kaypro 2000 is the 'base unit', which will fit underneath the existing computer and give the capability to add IBM-type expansion cards, additional disk drives, and other I/O functions.

This add-on will cost around $2500, but is not yet available in New Zealand.

There is also expected to be available an upgrade to provide 640K of memory.

One improvement I would keenly seek would be an upgrade to swap the present screen for a back-lit LCD display, which I have seen advertised in Australian magazines.

Despite these gripes, the Kaypro 2000 deserves serious consideration if you are looking for an IBM-compatible portable with good looks, word-processing, and a desk-top windowing capability.

KAYPRO 2000: SUMMARY

Manufacturer:	Kaypro Corporation, USA.
Processor:	Intel 8088
Operating System:	MS-DOS
Standard RAM:	256
Disk Drive;	1 720K 3.5 inch micro-floppy
Display;	640 x 200 graphics or 25 lines of 80 characters, LCD
Input/Output:	Serial port, telephone/modem port, 100-pin connector
Keyboard:	77 keys, 10 function keys, cursor control keys, auto-repeat.
Price:	$4550

Review machine kindly loaned by Hi-Tech Micro, Auckland.

The Travelling Expense Manager expands the potential usefulness for organisations with employees who travel in their work, and the communications software should enable transfer of files and data.

If you don't mind the less-than-perfect display and the lack of a parallel printer port and are not likely to need any other software, then the system could be a good buy at $4550.

The Kaypro 2000 might be just the thing to keep you going in the meantime while you wait for the elusive, perfect portable. ■

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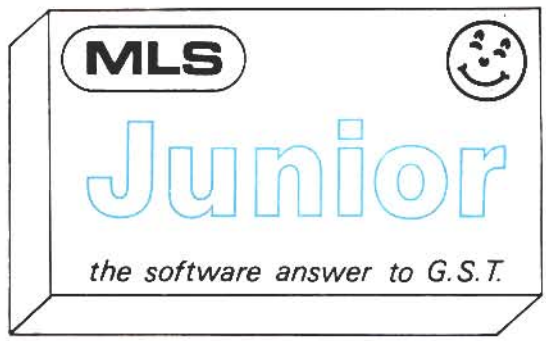

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The principles of Pick

by Mark James

Two years ago, Mr Dick Pick and his company, Pick Systems, launched a massive publicity campaign for the computer operating system that bears his name.

The purpose of the campaign was to challenge the rising star of Unix; most people, it seemed, thought that Unix was the only independent multi-user operating system around, and the Pick people wanted to change that.

Is the Pick system really as good as it claims to be? Is it the only alternative to Unix for small multi-user computers?

This month the multi-user column looks at Pick and what makes it special.

Pick, like its opposition, advertises itself as a system directed at business and management.

Like Amps, it is built entirely around a database; the functionality and efficiency of Pick is therefore dependent on that of its database.

Unlike any of the other multi-user systems, however, Pick's database is structured entirely upon a data dictionary.

This gives Pick a level of flexibility unmatched by its rivals; but also imposes some penalties on its users, especially for large databases involving heavy use of the disk. We shall see why in a moment.

Pick distributors in New Zealand include Online Business Management (OBM), Ultimate Computers, AWA and Prime. Each sells a range of hardware as well.

The versions of Pick that companies sell are not fully compatible; each has gone in for some non-standard enhancements to the generic Pick system. In this article, we will limit ourselves mostly to generic Pick.

Interpreted

Most independent, portable operating systems (that is, those which are not dependent on any particular type of hardware) use a trick known as a "virtual machine".

This means that the operating system software is written in an ideal assembly language – not one for a real computer, but one for an imaginary, ideal computer conceived for a particular purpose.

Then, in order to run the operating system on a real computer, its pseudo-assembly language must be translated into the real assembly language of the computer concerned.

Most "virtual machine" operating systems do this by going through an interpreter for the pseudo-code; this means that each pseudo-code instruction is interpreted by a subroutine in real assembler code.

Some implementations of Pick, however, attempt to bypass this interpreter phase by compiling the pseudo-code directly into a machine's assembly language. If this is done properly, it can result in a significant improvement in speed.

The improvement is not as drastic as that between interpreted Basic and compiled Basic, but the principle is the same.

Unfortunately, the Pick version for the IBM PC/XT (and its clones) is interpreted, not compiled. This is apparently because the 8088 chip has no memory management instructions, which Pick needs to run in a multi-user environment; therefore, Pick must fake them in its pseudo-code interpreter.

Database

In spite of the fact that the Pick system is only now becoming widely known, the roots of the system go back over twenty years.

Multi-User series: Part IV

Dick Pick, a true 1960s computer guru, was arguably the first person in the world to design a complete operating system around a database and a data dictionary. In fact, the Pick operating system exists solely to run the Pick database.

Everything in Pick is defined in terms of a dictionary: When you log on, for example, your access privileges, the files and commands that you can use, are described as elements in your account dictionary.

The number and meaning of fields in a data record are defined in a data file dictionary, and relationships between files are simply references from one file's dictionary to another.

A dictionary-driven database has a great deal of inbuilt flexibility.

For example, fields can be added to records, or their sizes or other characteristics can be modified, simply by changing the dictionary for the file concerned.

Since the data is sorted on the disk as a series of variable-length fields, the content of those fields does not need to be changed when the dictionary changes. Only the order of the fields is important (and therefore this order, once defined, cannot be changed).

Pick takes full advantage of its dictionaries in its query language, which is called Access. (Some Pick implementations give it the rather pretentious name of English.)

As long as you know the names of files and their fields (these are defined in the master dictionary for your account), you can issue commands to do simple reports.

To find all clients with unpaid balances, for example, you might say LIST CLIENT-FILE WITH BALANCE > 0. The system would then chase through the dictionaries to find the appropriate records.

Penalty

There is, however, a performance penalty associated with all this flexibility.

Because the data is not stored on the disk in a fixed format, the system has to use a dictionary to figure out where any given piece of information is located within a record.

This has to be done for every single operation that Pick ever performs, since absolutely everything is done through the database and the dictionaries.

The same penalty that makes interpreted Basic slower (if more flexible) than compiled Basic, makes the Pick database slower than its competitors.

Pick has, in effect, an "interpreted database".

Programming in Pick

Programmerss who have had to write complex business packages in Microsoft Basic will cringe at the realisation that the Pick operating system supports only one programming language, and that is Basic.

Actually, Pick Basic (or DataBasic, as it is sometimes called) is not as bad as it sounds. You don't need line numbers (you can even have line names); you can create multi-line control structures such as IF/THEN/ELSE and LOOP/UNTIL; you can pass parameters to subroutines.

The language resembles DEC's Basic-Plus-2 in many ways.

Data may be read from the database using the dictionaries; since everything on the database is in character form, string functions may be used to parse or alter a database record.

References to a field or sub-field within a record must be by the ordinal number of that field or sub-field. That's not very programmer-friendly, but it's about what one expects from Basic.

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7005R

Perhaps the nicest thing about Pick Basic is that you don't have to use it. The dictionaries are so flexible that simple programs can be structured just be defining a field for everything that you might need to know.

Fields can even be defined as calculations from other fields, as in a spreadsheet. Then the Access query language can be used to obtain a screen listing or a printout of the desired information.

Frequently-used Pick and Access commands may be canned into a sort of command field called a Proc. Procs can serve as programs for most simple tasks such as client enquiries, although anything complicated, like an order entry program with complex calidation requirements, will have to be done in Basic.

Security and friendliness

PICK protects itself with standard password access.

This is not elaborate, and a good hacker could crack it. However, log-on programs exist that build their own access dictionaries, providing such security features as automatic shut-outs after a number of unsuccessful attempts to log on.

These log-on programs are not part of Pick itself – they cost extra.

The Pick database can be backed up either in its entirety or file by file.

Generic Pick has no incremental back-up facility (that is, backing up only that part of a file that has changed since the last back-up); however, both Ultimate and OBM sell Pick systems with that feature.

No version of Pick has any facility for transaction logging.

Pick cannot lock specific records or files, but it has a similar provision whereby those records which are in the disk cache (described below) may be locked.

This has approximately the same effect of preventing two simultaneous users of a program from issuing conflicting changes to the same information.

Since Pick has no index or key table structure to maintain, there is never a problem with index integrity. However, files must have their sizes declared when they are created; if a file should overflow its declared size, Pick can generally allocate more space for it, but there is a severe penalty for this in terms of system performance.

The user must stay on the lookout for files that are overflowing, or nearly so, and use the back-up and restore utility to reorganise them into a larger space.

Pick is not always a friendly system, especially to one not accustomed to its unusual jargon. Records are called "items", record keys are "item IDs", fields within a record are "attributes", and so on.

To those new to the system, there is not much in the way of on-line help; the novice must spend much time with his-her nose in the manuals.

For example, when you create a file and must declare its size, Pick doesn't ask for the "file size"; it aks for something called "modulo" and "separation".

Even those who know what this means could find it difficult to guess the best modulo and separation for a file that does not yet exist. (Modulo and separation are parameters used in the key hashing algorithm, described below.)

Pick's editor, called ED, is essential to the system, but is horrible to use. It is a line editor, like the MS-DOS EDLIN program.

It operates directly on dictionaries and data items, and is in fact the primary means of modifying them. It is the single feature of Pick most glaringly in need of

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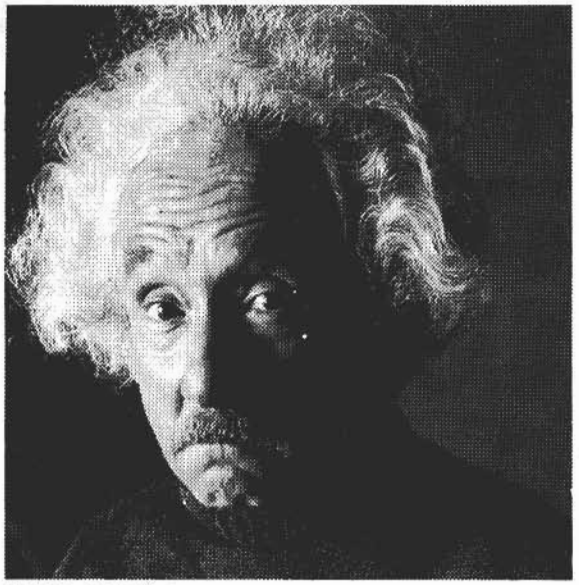
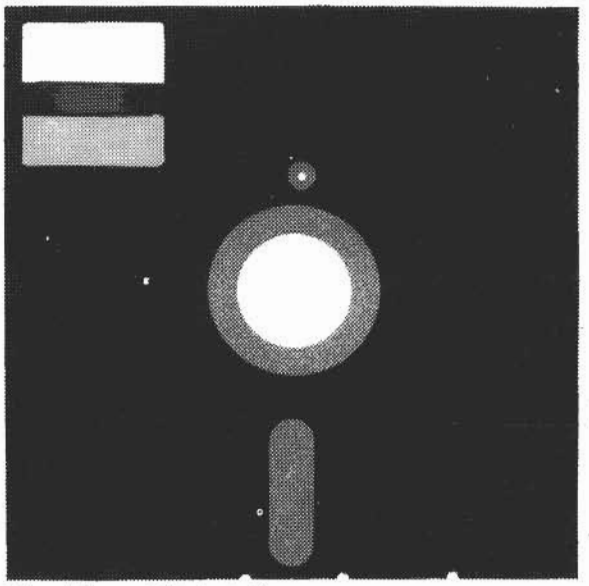


Einstein Lookalike
Left school Age 9
Works as caretaker in glue factory
Failing Memory
Likes a drink



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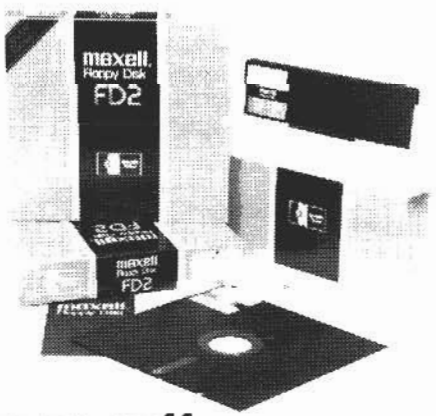

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reform, as it is unacceptable for any serious word processing.

(Many Pick implementations supply their own full-screen text editors, but it is not clear whether they could be used on dictionaries or files.)

In spite of these deficiencies, Pick, is easy to get used to.

Efficiency

With the overhead of the dictionaries, one would expect Pick to run like a limping dog, but it doesn't.

In fact, the response times of Pick on an IBM PC/AT with two simultaneous users are quite acceptable.

Except on a heavily-loaded system, most people will probably not notice the extra work that the dictionaries impose.

Pick uses two tricks to speed things up a bit: disk caching and key hashing.

Disk caching (also called "demand-paged virtual memory") is simple in concept, but not trivial to implement well.

Whenever you need to read something in from a disk, there is always a chance that you already have it in memory. Since disk accesses are always one of the worst bottlenecks in the system, it is generally worth checking to see whether the information that the system seeks is already in memory somewhere.

A disk cache is a set of buffers set aside for this kind of checking; the trick is to gain more in efficiency, by avoiding unnecessary disk accesses, than you lose through the overhead of checking the cache all the time.

In Pick, most of the computer's memory is devoted to disk caching.

In repetitive or frequently-used programs, the probability of finding a "hit" in the cache becomes very good.

Key hashing

The other trick, key hashing, is more problematical.

When Pick needs to store a record on disk, it does not maintain a key table or index structure. Instead, it "hashes" the key (a client's name, for example) into an arbitrary number, and uses that number as a pointer to a disk block where it stores the record.

When it comes time to fetch that record, the user supplies the client's name; Pick hashes it into that same number, and thus knows where to go to find the record.

As long as you know exactly what record you wish to find, hashing is the fastest known method of getting to it. There are no tables to look up and no index trees to chase through.

However, hashing also guarantees that the data within a file will be stored in a completely random fashion, and if you want any order out of it at all, you have to do a sort.

There is also no way to find a record if you don't know its exact key, except by scanning through the entire file.

Pick has no "Get-Next" or "Get-Previous" facilities, since these concepts have no meaning in a database that has no order.

Summary

If there is plenty of free space on the disk, key hashing will work very efficiently; if not too many people are using the system at once, the overhead of the dictionaries will not be significant; and if the programs are not too complex, the dictionaries and procs will greatly ease the task of programming, and the lack of such features as find-on-partial-key will not be noticed.

For people whose needs fall into this description, it would be very difficult to find a multi-user system more flexible and more functional than Pick. ■

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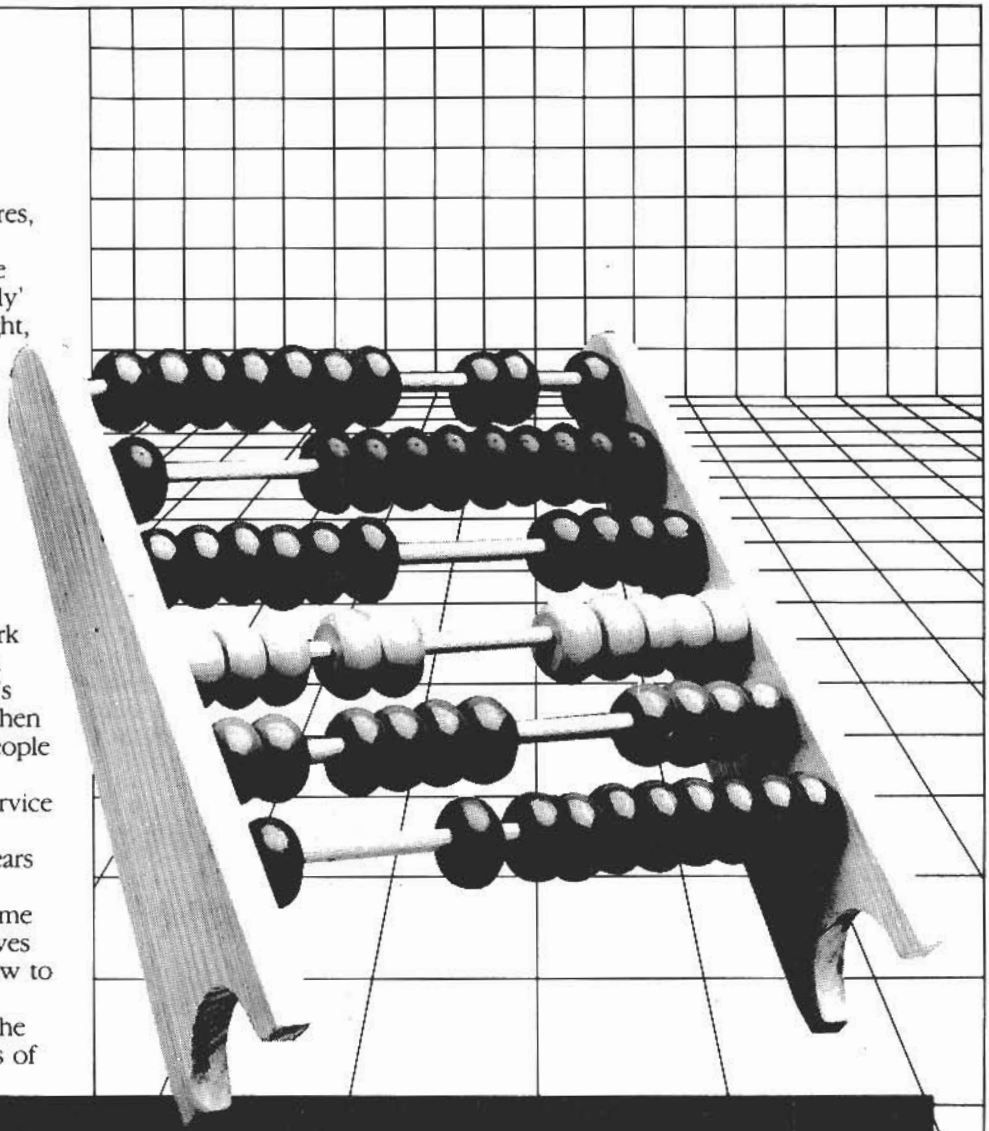

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Fast floppy back-up to hard discs

by Peter Biggs

Backing up files on a hard disc on to floppy discs usually requires 30 floppy disks and an awful lot of patience and time.

The DOS utilities are slow and cumbersome but it's the best that could be done unless you bought a tape cartridge back-up system at a cost of $2000 or more – the cost of the hard disc itself!

Most users know that to recover from a hard disc, self-destructing would be a major effort so the market for a fast and convenient backup utility has been evident for some time.

Now it's here – Fastback from 5th Generation Systems, USA – and said to incorporate AI techniques.

It can be used for both the XT and AT systems and backs up and restores files from a hard disc to floppy dics – fast and conveniently.

It claims to back up 10 Megs in 8 minutes – a claim that it lives up to.

I received Fastback in a package containing one disc, a small manual and a couple of promotional brochures.

I inserted the distribution disc and typed FINSTAL.

After answering a number of simple questions, Fastback was quickly installed on my 10 Meg hard disc in a directory \FASTBACK, which is made by the program.

Fastback has two main programs – the backup file called FASTBACK and the restore file called FREESTORE. In the CONFIG.SYS file, 'buffers' should be set to 24.

The manual is clearly written and adequate although I would like to have known some ramifications of running the programs before I started.

Scrunched storage

Typing FASTBACK brings up a screen that shows, in colour if you have a colour screen, the total Elapsed Time, the Operator time (ie time to change disks) and the DOS Performance.

In this context, this refers to the time ratio between reading files from the hard disc to writing them on to the floppy disc. If this is less than 100, reading from the hard disc is behind writing to the floppy disc.

Files are saved on the floppy discs in a 'scrunched' form that requires Fastback to restore them so the back-up discs are unreadable by DOS.

I could choose to back-up the entire hard disc or selected directories and files – as well as only those files which have changed in a given time. I chose to back-up the entire hard disc.

It's a race against time as Fastback formats and writes an entire 360K floppy disc in about 40 seconds. DOS takes 65 seconds to just format a disc!

Each floppy disc holds 0.45 Mb and I managed to take about 5 seconds to change each floppy disc (the manual says it can be done in about 4 seconds).

FASTBACK:

My hard dis holds 7.6 Mb in 637 files – Fastback took only 7 minutes to back it up completely on to 17 floppy discs. 90 seconds of this time was taken up with swopping discs but having two floppy drives will remove even this time overhead.

The DOS performance was constantly monitored and only began to suffer when large directories of over 100 files were encountered.

Vital catalogue

Fastback then writes a Disc Catalog onto the directory FASTBACK. This catalog is vital if you wish to restore files at some time in the future. Copy it onto a floppy immediately so you don't lose it.

One strange quirk of Fastback is that if you run it again and ESCape out of it, this valuable file is deleted from the directory – without telling you beforehand. To restore a file then requires you to hassle with 17 discs – not fun as I learned to my cost.

To get this catalog back again I then had to run Fastback again and, using the same discs I used in the first back-up, back-up the entire hard disc again.

Note that Fastback does not recognise previously written back- up discs so keep them very separate. The restore program however does recognise the back-up discs.

This catalog is a list of the files on my hard disc. It can be printed with the CTRL P then TYPE commands but it took 24 pages! Why – because it puts spaces at the end of and between each line.

I pulled it into PFS-Write and manually removed the spaces between 600 odd filenames and saved it again as an ASC file. It then took only 11 pages to print out!

Whereas the back-up facility is copy protected by needing the original disc to start it, the restore program is not. I would keep this and the catalog file FASTBACK.CAT on an ordinary disc in a safe place.

A number of options are available to restore files, such as singly, by directory, and only those changed since the last back-up. All archived files on the hard disc are reset to 'normal' when backing up is completed.

The screen for choosing to restore files is very easy to use. I readily restored a whole directory of files on to my hard disc.

Obviously I never reformatted my hard disc to see whether the entire back-up worked but I am confident that it would if it came to this.

Copy protection is the major problem with Fastback. The distribution disc is needed to start the back-up and this disc is copy protected using an unreadable bad track on track 39.

If this disc is damaged or misplaced, the hard disc cannot be backed up and a second disc is not supplied. For an extra US$25 it seems you can get an unprotected version of the program – with your name incorporated into it.

The copyright notice as usual has all the threatening tones common to much of the current software although this one has a few extra hectoring touches.

Consumers will eventually decide this issue by refusing to buy user-unfriendly, unsuitably copy-protected software.

It also seems Fastback can be installed time and again on to a hard disc but it will always need the distribution disc to start the back-up facilitiy. To de-install the program, simply delete the program files and then the directory.

Much needed

In conclusion, Fastback is an excellent and much needed utility to back-up a hard disc – as fast and convenient as is probably possible.

It requires PC or MS-DOS 2.0 or higher, 128K of memory and, obviously, at least one floppy drive.

It works with both XT or AT industry standard computer systems.

It costs $360 in New Zealand and two packs of discs will cost around $100 – $130, so for under $500 your hard disc can be completely backed up and then continued to be backed up using only those files which are new or have been changed.

Yes, it's good value for money but I would like to see two key discs for this price. I consider users deserve this.

Certainly, set against the cost for recovering lost data and program files in the event of a hard disc failure, it is well worth it. ■

The review copy was supplied by Computer Store, in Auckland.

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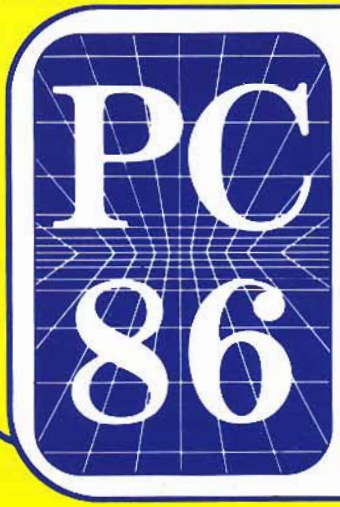

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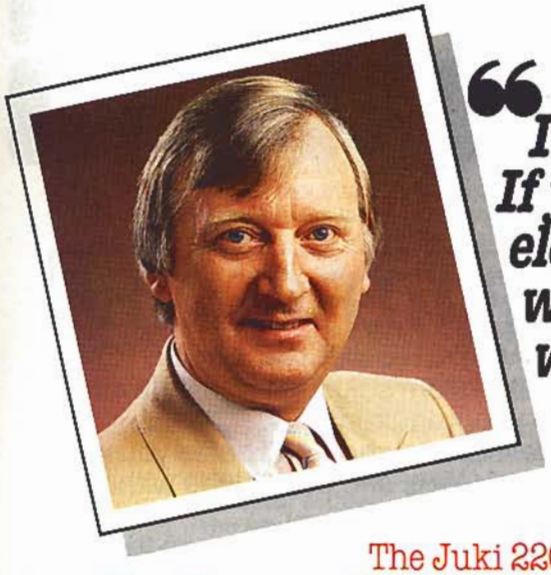

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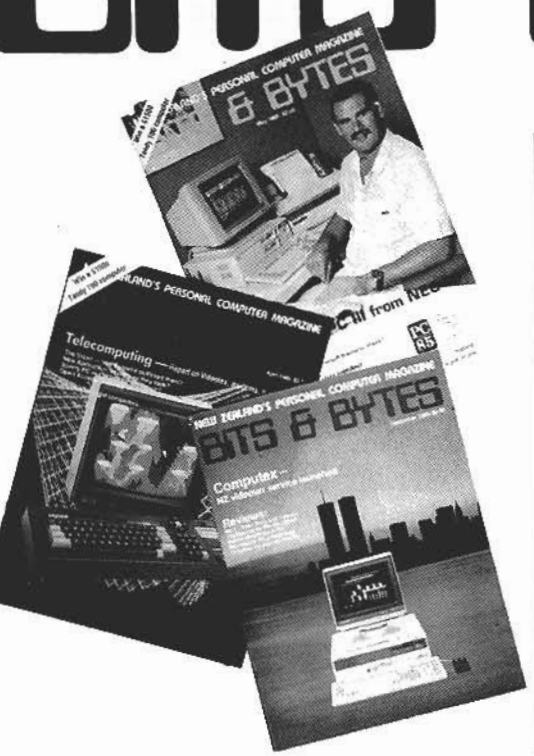

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Software and hardware developments have brought the humble personal computer to a position of power: today the PC is the vital element in any computer installation, large or small.

At PC86 you will see the survivors in the market, the hardware and software which is being aggressively marketed and to which the suppliers are dedicated.

The new technologies have been combined with a user friendliness that was talked about two years ago but which is a reality today. At PC86 many new products will be displayed and demonstrated. Also, the new strata of services and consultants which have become an important part of the industry's infrastructure, will participate.

The keenly awaited Amiga from Commodore, Archives' new Micro Five multiuser PC, Ergo's multiuser compatible and three preview machines from Olivetti are amongst the highlights of the new hardware being introduced to the New Zealand market. In the software field there is a new generation of multiuser software and networking products which will be of interest to visitors.

The new Paradox data management package being launched here by Imagineering is a revolutionary concept which utilises artificial intelligence and which is being lauded as a brilliant new concept in data management technology.

Whether visitor or exhibitor at PC86 we wish you well and hope you enjoy three days of good business, taking the opportunity to learn more about the computer industry, its people and its directions in New Zealand.

ARCHIVES COMPUTERS N.Z. LIMITED
16 Clonbern Road, Remuera, Auckland 5
(9) 503-548
John Smith
Ivon Duurloo
Gower Smith Managing Director, Archives Computers Australia
HARDWARE: Archives, multiuser specialists have chosen PC86 to launch the Micro Five, a technically sophisticated AT compatible. It has a standard IBM bus for compatible peripheral cards and software and is designed specifically to drive multiuser systems. Supported by several different multiuser environments –
PC SLAVE with up to 8 multiprocessor cards supporting 8 users;
XENIX timeshare with up to 16 terminals sharing 8 megabytes of RAM
iii) NOVELL network with up to 16 PC workstations per Micro Five Server
SOFTWARE: Range of multi-user business and accounting software, currently available for over 200 different microcomputers.

ANDAS ACTION LINE
(04) 844-074
George Bright, General Manager
HARDWARE: Juki 2200 electronic daisywheel; typewriter/printer; Printer ribbons

BARSON COMPUTERS LTD
1 Ngaire Ave, Newmarket, Auckland
P.O. Box 26287
504-630
Greg Magness, Clive Raines
HARDWARE: Apricot, BBC Tandom PC and ATs
SOFTWARE: Business Software for the above range

BEECHEY & UNDERWOOD
373 New North Road
Auckland
(09) 799-800
Bob Meribito
HARDWARE: Sharp range of PCs
SOFTWARE: Range of business packages.

CANON DATA PRODUCTS
10–14 Como Street Takapuna
P O Box 2191 Auckland
492 176 492 006
Keith Williams, Bruce Coutts, Fred Davenport, Vince Williams, Ken Barry
HARDWARE: Canon AS-300 Business System, Canon A200 PC Compatible, Canon TX-50II Retail System, Canon LBP 80 Laser Beam Printer, Canon IX8 Image Scanner, Canon Peripherals
SOFTWARE: Canobrain II, CanoWriter II plus Super Canobrain BOS Software Multiuser Business Systems Canon Data Products Business Accounting Systems Canon Data Products Retail Manager

COMMODORE COMPUTER (N.Z.) LTD
250 Forrest Hill Road, Forrest Hill
410-9182
Mike Cooch (Marketing) Richard Thornton (Sales)
HARDWARE: Commodore: C16, Plus 4, C64, C128, PC 10/20, Amiga.
SOFTWARE: Home – Business and Recreation, Education – Home and School, Business – Small and Medium.

COMPUTER STORE
48 Kitchener Road, Milford
P.O. Box 31-261
AUCKLAND 9
499-458
Mr E Zimmermann
HARDWARE: Marchant Retail System Scala Computer
SOFTWARE: Borland Sidekick, Bottomline Capitalist, dB Compiler, Fastback, GEM Collection, GEM Draw, PC-Alien, SuperCalc, SuperWriter, Borland Turbo Pascal, Bottomline V, dBASE, Framework, GEM Desktop, Micro Focus Cobol, Samna Word Processing, SuperProject

COMPUMEDIA SYSTEMS LTD
16 Woodson Pl, Glenfield
444-6085
HARDWARE: Peter Corkery, Leanne Wardell, Sharon Nilsson
SOFTWARE: Maxell Disks
BSSF Magnetic Tape, precision printer ribbon, computer paper, AFL Computer Cleaning Products, Precision Computer Furniture, other accessories such as Anti-Glare screen filters and Disk storage/mailing units.

COWAN BOWMAN ASSOCIATES LTD
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34-161
Vicky McCullough
SOFTWARE: CBA Business Package

DATACOM EQUIPMENT LTD
89 Courtenay Place, P.O. Box 6541, Wellington
846-189
Craig Wallace, Roger Paaymans & Glenn Ricketts.
HARDWARE: Impact & Laser Printers, VDUs, Protocol Convertors, Protocol Interfaces and other Peripheral and Communications equipment

DICK SMITH ELECTRONICS
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(09) 504 408
Yann Duran, John Gourley.
HARDWARE: Multitech PC, printers, monitors.
SOFTWARE: Extensive range, business, games and educational packages.

ERGO COMPUTERS LTD
P.O. Box 68-325 Newton
(09) 765-663
Richard Green, Campbell Such.
HARDWARE: Compatible AT/XT Super AT, Super XT and Turbo. CAO/CAM, Evernet network.

FARMFAX LTD
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(075) 86670
John Bates, Joe Bray
HARDWARE: HP Sigma Data, Apricot & Sanyo PC Range
SOFTWARE: Agricultureal and Horticultural markets.

GENISIS SYSTEMS LTD
47 Station Road Otahuhu
276-7349, 276-361
S. Oswald, M. Weavers, L. Howe, G. McLennan, D. Goodchild
Hardware: Star Dot Matrix Printers

GRANDSTAND COMPUTERS LTD
21 Great South Rd, Box 2353, Auckland
504-035
W.R. Fenton, L. Kenyon, Terry Perreau, Phil Kenyon, Steve Kenyon, Jenny Gurteen.
HARDWARE: Amstrad 464 (for the home), Amstrad 128 (small business), Amstrad 8256 (office word processor).
SOFTWARE: Full range of games and business software for Amstrad.

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Dave Holland, Andrew Jackson
PRODUCT: HP 150 Touch Screen PC, Vectra, Laser Jet Plus, Plotters and handheld computers.

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(09) 399 183
Chris Edwards, Russell Sinclair, Phil Lomax.
HARDWARE: Kaypro, President networking system, Accutrack disks.

IMAGINEERING
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Private Bag, Takapuna.
444-5088
Paul Dixon (GM), John Cortese (Sales Manager)
HARDWARE: Hercules, Persyst Intel PC Boards 3 com.
SOFTWARE: Lotus, Micropro (Wordstar) Ansa (Paradox), PFS Series Flight Simulator and many other business and entertainment packages.

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SOFTWARE: AUTOCAD.

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Grant Hackett, Brent Sutton.
SOFTWARE: MLS accounting software packages for small to large businesses, including multiuser systems.

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SOFTWARE: YAMAHA and Digital Music Systems. Composing, Sequencing, voicing (MSX) MSX floppy disc, prints, etc. Music education software.

NORTHROP INSTRUMENTS & SYSTEMS LTD
Private Bag, Newmarket.
459 Khyber Pass Rd.
545-065
Peter Mancer, Mark Bennett.
HARDWARE: TEAC disk and tape drives, tacit printers,
SOFTWARE: KIMTRON terminals, PC upgrades.

NZPO - Telecommunications
PO Box 292 Wellington
WN 737 625
Gil Tremeuan, Marketing Manager.
HARDWARE: Videotex Service and Stornet Service.

OLIVETTI NZ
(Toll free line 733-411)
HARDWARE: Olivetti M24, M24SP-multiuser, M21 luggable, ETB25.
SOFTWARE: AIMS – assurance industry package, Standard industry packages.

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Mailorders & Postal: P O Box 54-069 Bucklands Beack, Auckland
562-441 Telex: NZ 63500 PARELEC
Maurice Bryham, Peter Parsonage
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SOFTWARE: Orchard management programme, Hire Purchase Financial Package, Charter and Sybiz accounting packages, Building Contractors' management systems.

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— TECHNOLOGY REVIEWS VOL 3 Nos 2 and 3 November 1985.

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THURSDAY MAY 8TH

Session 1: GST – What's Required
10.30am Deloitte Haskins & Sells
Session 2: Small Business & Computing
12.00am KMG Microlab
Session 15: CAD/CAM and the PC
1.30pm Warren Wilson, Machine-head
Session 4: Local Area Networks
2.00pm Tony Dixon, Calibre Group Ltd
Session 10: Useful Software for Small Business
2.00pm KMG Microlab
Session 5: Multiuser Networks
3.00pm Mark James, Advanced Management Systems.

FRIDAY MAY 9TH

Session 12: Small Business and Computing
10.00am KMG Microlab
Session 3: Videotex – an overview and introduction
10.30am Janey Copsey, Infospecs
Session 6: Production farm software
11.00am Dr John Bircham, Decision Software Ltd
Session 7: Farmers Needs in the Computer Market
1.00pm Koss Baars, Ruakura Soil & Plant Research Stn.
Session 11: Useful Software for the Small Business
12.00pm KMG Microlab
Session 8: Stock Accounting Management
2.30pm Jonathon Hooper, Daisy Computer Systems
Session 9: Closed User Groups in the Commercial Environment
3.00pm Tim Edney, Fisher & Paykel Ltd

SATURDAY MAY 10TH

Education and Computing – A series divided into 2 parts

PART 1 Directions for the Future – Stuart Hale

Databases as an information source – Rosaleen White, Paul Left

Setting Up Computer Facilities in a School – Mary Matthews

What USE are Computers In Schools – Tony Hunt

PART 2 Using Computer Courseware – Hans Behrends, Graham Prentice, Colin Marshall

What's Around in Educational Software – Ms Ann Frampton,

Computer Courseware Development Unit
Directions for the Future – John Slane, Department of Education.

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SOFTWARE: Sybiz, ASCENT, Charter, C.B.A., Acclaim, Open Access, Lotus 123, Prism (printers package) plus lots more.

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P.O. Box 9224 Auckland 1.
Selwyn Arrow
Alex Hampton
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SOFTWARE: Cashlink accounting.

SOUTH AUCKLAND COMPUTERS
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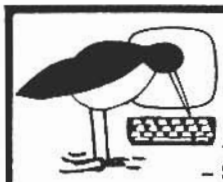

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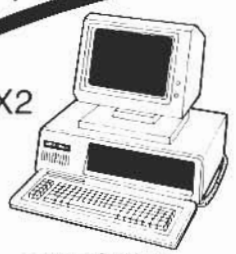

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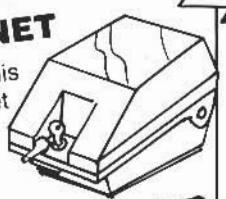

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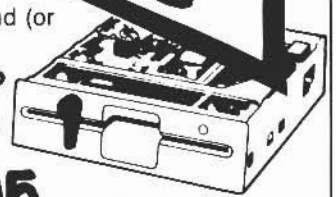

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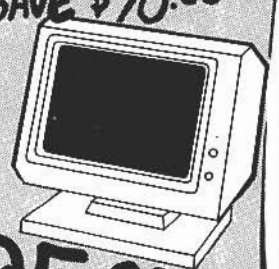

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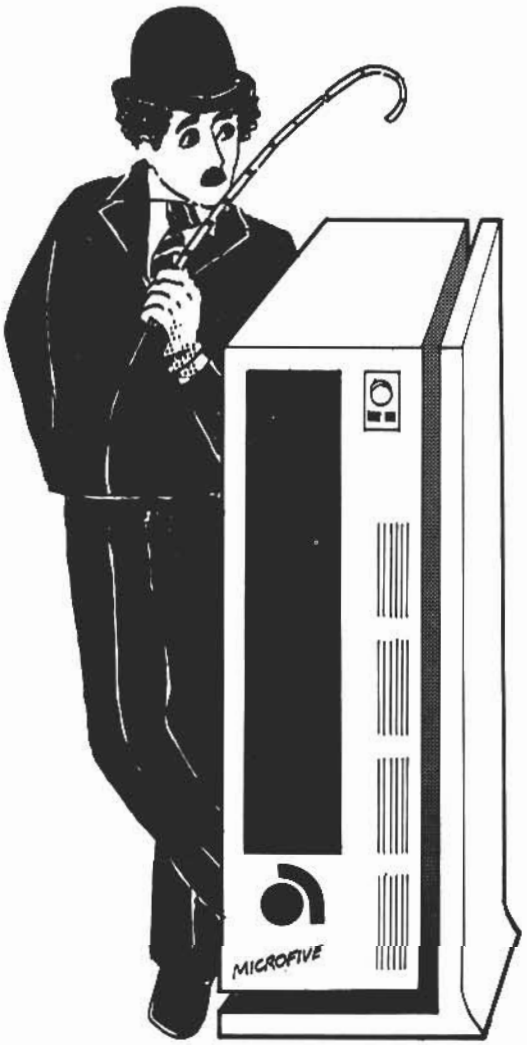

With PCs and Multi-user systems offering unbelievable performance and technical innovation, at affordable prices, it's no wonder minicomputers are fast becoming obsolete. Just check out some of the features the Archives Micro Five Multi-user system offers and then decide for yourself.

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Twice the performance of an equivalent IBM AT system for less cost (see PC Week review and MicroFive tests).

XENIX
Combined with Kimtron KT5/PC terminals and the Xenix operating system, the Archives MicroFive delivers more power than top range superminis (see Byte benchmark), at a fraction of the costs: 1-16 users available.

NOVELL
Other PCs or standalone MicroFive systems can be connected to the Archives MicroFive as the central server in a local area network (LAN). Novell Corporation has endorsed the MicroFive as their top line 286 server offering up to 128 users and 2 Gigabytes of storage in the most sophisticated LAN available (see Novell test results). Many other LANS are also fully compatible with the Archives MicroFive.

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Plug in the PC-Slave and Kimtron KT7 terminal to provide the highest performance, low cost multi-user system offering full IBM PC software compatibility.

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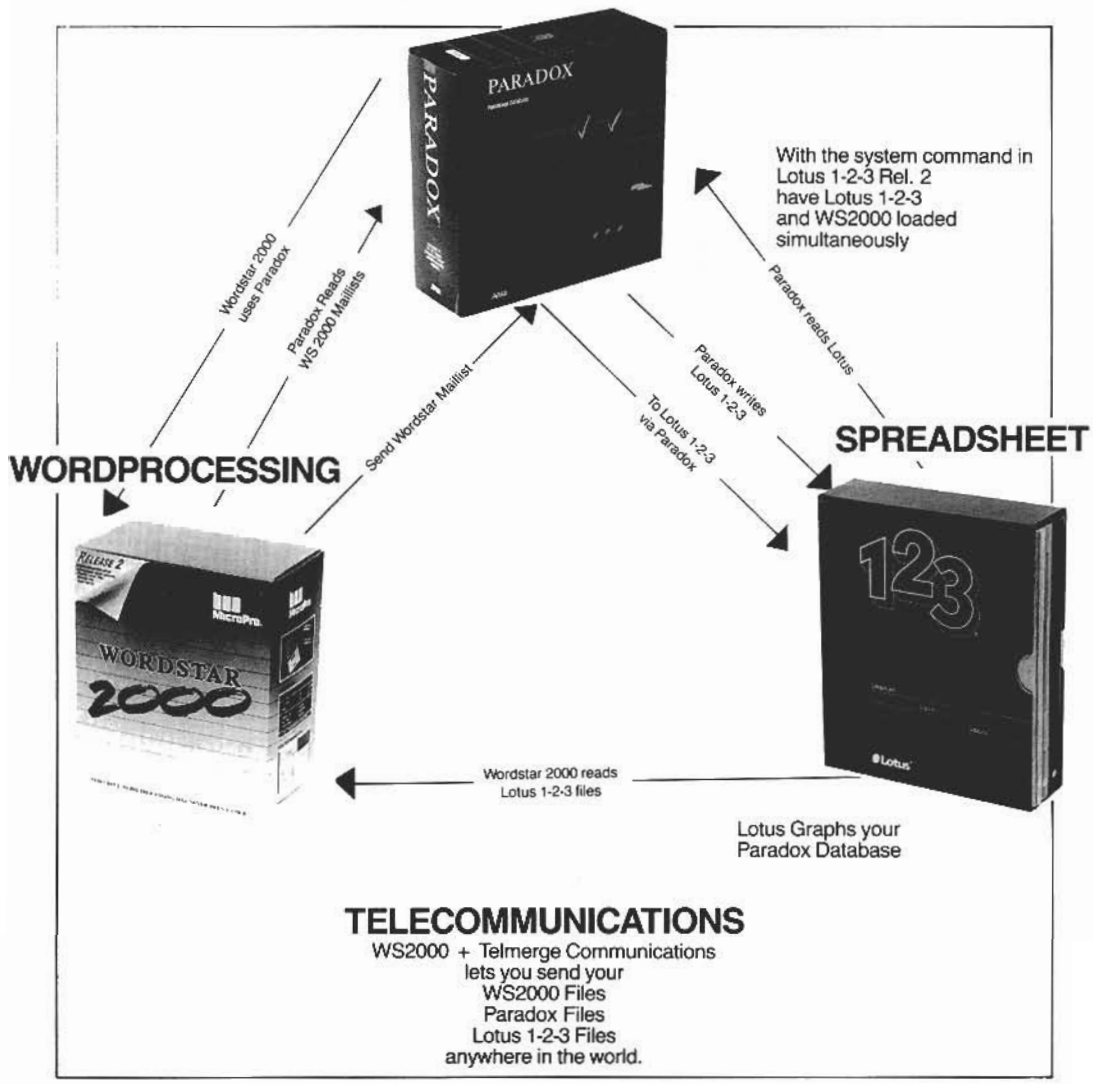

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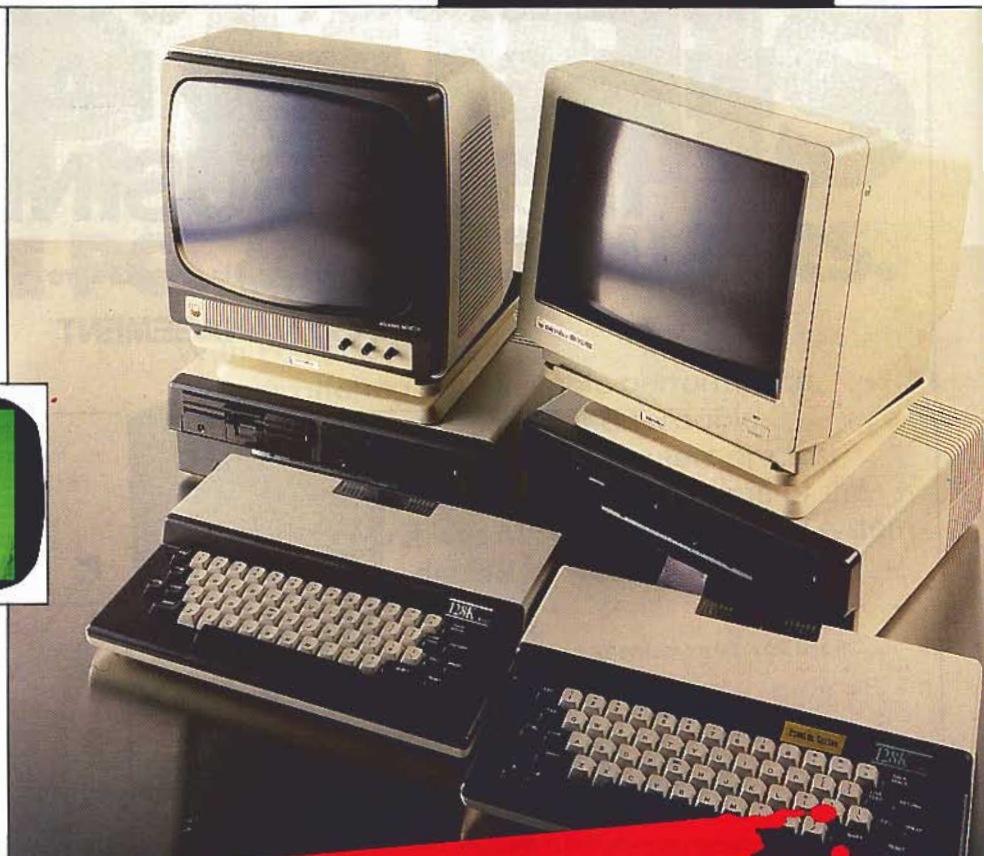
This shows the graphics resolution of the new Premium microbees. It is possible to display 131,072 individually controlled pixels.

Of course the Premium models will cost a little more, but they're still cheaper than upgrading later. Briefly you get: Videotex and colour video as standard; greatly enhanced graphics capability; four extra keys for cursor control; improved video circuitry and a volume control for the internal speaker.

These improvements increase the flexibility of a Modular Microbee computer and let you choose the computer that's right for you.



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Example: Microbee Modular 128K Computer

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The Premium version of the 128K Computer provides all of the features of the standard model.

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*Standard model above shown with economy monochrome monitor

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For beginners and experts

by Bruce Simpson

Pascal: Part II

This month I will be hopefully setting the format for future columns. I am aware that Bits and Bytes appeals to a very wide range of people, from those who simply have a passing interest in computers, to those who may have spent thousands of hours and dollars building up their machines and skills. It is my intention therefore to try and provide a little bit of value for all concerned.

Each month I shall write on the fundamentals of Pascal programming for the novices plus some more advanced topics, for those who almost know it all.

Cheap start

For those considering taking the plunge into the fascinating world of personal computers, the number of relatively low cost micro's capable of running Pascal is increasing almost daily.

If you intend to get serious about using Pascal (or any compiled programming language for that matter), make sure that you get a computer with a disk drive. Using a cassette tape will drastically limit your choice of programs (except for games) and you will soon get very tired of the endless hours spent waiting while information is loaded and saved.

Any computer you decide upon for Pascal programming should run either CP/M, MSDOS, or PCDOS operating systems. Without any of these operating systems you will again severly limit your choices of Pascal compilers.

Some of the available machines which appear to be ideal for low budget Pascal programming are:

- AMSTRAD 128k or 256K USING CP/M plus
- MULTITECH PC from Dick Smith using MSDOS
- BONDWELL 12 using MSDOS
- BONDWELL 12 using CP/M
- TANDY 1000 using MSDOS
- SANYO MBC550 using MSDOS

There are no doubt many more brands and models.

The ideal choice of Pascal compiler for a low budget 'beginners' system would have to be 'TURBO PASCAL Version 3'.

It should be possible to get started with computer and compiler for around $1,600 to $2,500, depending on exactly what and where you purchase.

Just another thought, the new ATARI 520ST should be available in NZ sometime this year. I have already spent sometime playing with this machine and it appears would be an excellent Pascal machine, provided a decent compiler becomes available.

Some quick calculations based on the price differences between US and NZ prices of other machines would appear to make the 520ST around $2,500 with disk, when it finally arrives.

Turbo Pascal

As I have said several times before in this column. Turbo Pascal is the best value Pascal compiler on the market. However a word or two is necessary for those who are considering this as their next purchase.

Unless you have a 100% IBM compatible micro, make sure you try any copy of version 3.0 on your own computer before you buy.

Although the IBM PC version of Turbo 2.0 will run on several 'close compatibles' (Sanyo 550 series, Tandy 2000, etc), version 3.0 for the IBM PC may not.

It appears that version 3.0 gains many of it's spped increases as a result of bypassing the MSDOS operating system. Unfortunately many machines that are not 100% IBM PC compatible will demand that the plain vanilla MSDOS version be used.

The only copies of version 3.0 for 16 bit micros I have seen so far on the dealers shelves have been for the IBM PC, so be warned.

By the way, none of the windowing or graphics commands found on the IBM PC version will work on a plain MSDOS version.

Make sure that you shop around when looking for Turbo Pascal. I have seen it on sale in one shop for nearly $300, whilst just across town the very same product was going for only $145.

Well, that's the beginner's taken care of for another month. Now a little something for those who have already started using Pascal.

BCD versus BINARY

Most Pascal compilers allow you the choice of BCD or binary real numbers (Turbo uses two different versions of the compiler). Both types have their advantages.

Binary real numbers have the advantage that they are a very compact method of storing numbers and they are very easy for the computer to perform maths operations upon.

Compilers using Binary reals usually only need 4 to 6 bytes per variable and provide a full range of trancendental functions (sin, cos, etc).

The range of values that can be expressed is usually very high thanks to the use of scientific notation.

Binary reals are normally used when a program needs to perform trig or operate on a large range of values and where very small errors are not considered a problem.

Yes, you read correctly, using binary real numbers can result in errors even during the simplest of maths operations.

Try this program to see if your version of pascal suffers from what are called 'binary representation errors'.

```
B>test
starting
0.00000000000000000
 1.00000000000000E-002
 2.00000000000000E-002
 3.00000000000000E-002
 4.00000000000000E-002
 5.00000000000000E-002
 6.00000000000000E-002
 7.00000000000000E-002
 8.00000000000000E-002
 9.00000000000000E-002
 1.00000000000000E-001
 1.10000000000000E-001
 1.20000000000000E-001
 1.30000000000000E-001
 1.40000000000000E-001
 1.50000000000000E-001
 1.60000000000000E-001
 1.70000000000000E-001
```

```
Program mathtest;

var     r1,r2 : Real;

Begin
  Writeln('starting');
  R1 := 0.01;
  R2 := 0.0;
  while r2 < 100.0 Do
  Begin
    Writeln(r2:20:18);
    R2 := R2 +r1
  End;
End.
```

Don't be surprised if you see some mighty funny numbers appearing on your screen. The reason for this is an inherent defect in the binary method of storing decimal fractions. As you are probably aware, there are some fractions that can not be expressed exactly in decimal form. eg: ⅓ can only be expressed approximately in decimal form as 0.33333333... because the sequence of threes continues infinitely. No matter how many threes you add, the decimal number is never exactly equal to the fraction ⅓.

The same problem occurs when the computer tries to store a decimal fraction such as 0.1 in a binary form. No matter how many digits the computer is capable of calculating to, the value of the binary number stored will never be exactly 0.1.

Although this error is very small, if you perform sufficient calculations on the number, the error will eventually become large enough to show.

This can become a definite problem if you are dealing with money, after all a cent is a decimal fraction of a dollar and every cent has to be accounted for!

What about BCD real numbers? BCD real numbers are capable of storing decimal fractions exactly, without error. Whenever you write programs that handle amounts that represent dollar values it is highly recommended that you use BCD reals.

Of course nothing is for free in this world and BCD reals do have their disadvantages. These are: the extra storage required as well as slower and more limited maths capabilities. Few (if any) Pascal compilers will allow you to perform trancendental operations on BCD real numbers.

The main reason for this is the speed penalty that is incurred by using BCD reals.

CBASIC is the only language I have ever seen that allows trig functions to be used with BCD reals and it is both slow and inaccurate.

BCD reals usually require 10 bytes of storage compared to 4 to 6 for binary. This can be important when RAM or disk space is limited.

Other ways

If your compiler only supports binary maths and you wish to write a program that requires calculations involving money, you can still use it without incurring 'binary representation errors'.

How? Simply treat all money amounts as whole cents. So $1.23 becomes 123 cents.

Don't forget however that you should divide all amounts by 100 before displaying or printing. You should also make sure that only whole numbers are entered from the keyboard. Although this may complicate your program somewhat, it's probably worth it to make sure that 1 + 1 = 2 at all times.

It looks as if everyone is getting on the low cost compiler bandwagon.

A new version of the UCSD Pascal compiler has been released in the US. Priced at under US$100, it claims to offer significant advantages over Turbo Pascal.

MSDS2, a low cost modula2 compiler is also being marketed in the US with a special trade-in offer for your old Turbo disk.

MicroSoft is offering a very similar deal for those wishing to purchase their new Pascal compiler. It will be interesting to see if this 'new lamps for old' marketing technique works.

* * *

I am happy to answer any questions on Pascal programming (or CP/M and MSDOS in general) that readers may have. Also, any small routines, hints, tips, etc that readers may wish to share will be gratefully accepted for publication. –

Bruce Simpson is an analyst/programmer with Montek Equipment, in Auckland.

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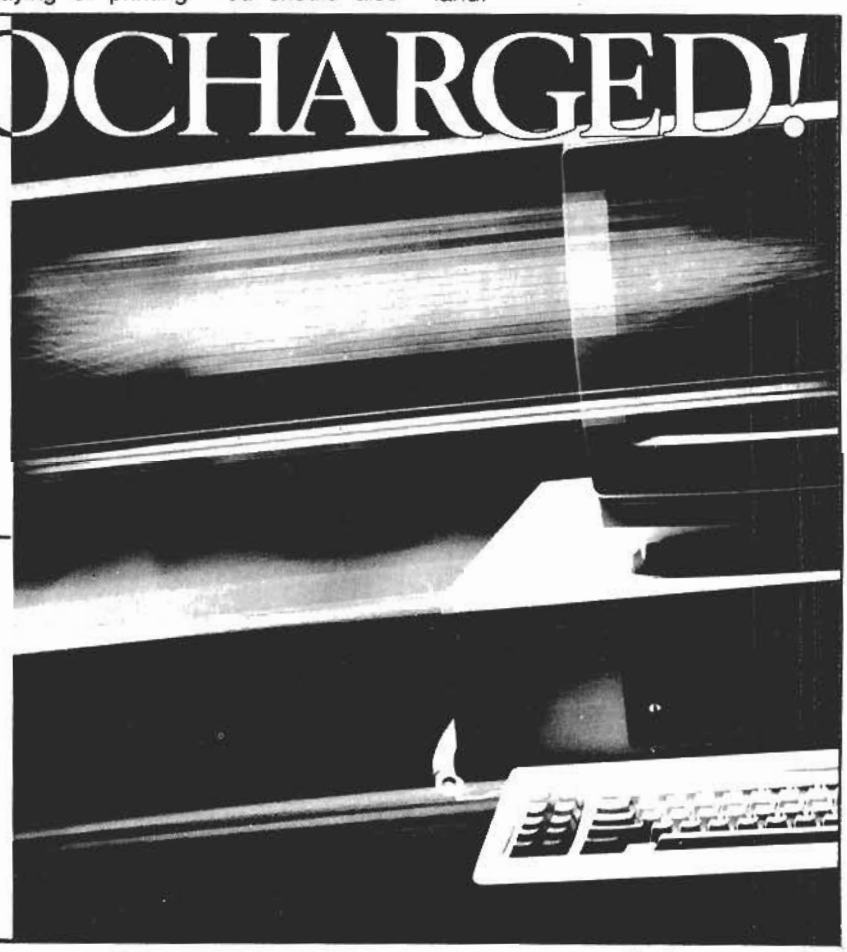

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All-in-one accounting software

Logical Methods of Auckland has recently launched a commercial accounting package, Profax, which has evolved from a series of software packages written for the Commodore whilst bearing resemblance to IAL's Charter series.

Profax is targeted at the smaller business and offers fully integrated Debtors, Inventory Control, Invoicing, Sales Analysis, Creditors and General ledger with a surprisingly high level of flexibility and functionability.

For the business with small volumes of data, Profax will successfully run on a twin floppy PC, though with the small price increment to purchase a hard disk anyone about to purchase a computer ought to look seriously at the increased storage capacity option.

Our review of Profax convinces us that it is perhaps the leading all-in-one product, out-performing Cashlink and Accounting One. Its strengths lay in the following areas:

- All reports can be displayed on the screen as well as the printer
- Data files can be expanded by the user
- Ability to handle debtor and inventory maintenance through invoice entry
- GST is provided for
- Handles flexible customer product discounting
- General ledger allows This Year, Budget, Last Year comparisons
- Ability to export Profax data to Lotus, Wordstar etc.

Prospective purchasers of Profax should recognise that it is a single screen MS-DOS solution without an upgrade option. So long as this is borne in mind, Profax can offer top software performance at a very good price.

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Sidekick

For those of you that haven't seen Sidekick or any of the other memory resident programs that "pop-up" we suggest you have a look.

We've got Sidekick and it's a fantastic tool for any PC user.

Sidekick loads when you first fire up your machine, then sits hidden away in your PC while you run other programs like Lotus, or your accounting system or whatever.

When you want a notepad, or a calculator or a calendar or other similar goodies just hit two keys and Sidekick pops up on your screen, over top of your existing application.

No more rummaging around the desk – Sidekick is ready to help you out, like the Sidekick of cowboy heroes of yesteryear.

We find Sidekick's notepad (a mini version of Wordstar) brilliant when documenting spreadsheets – you can note down your assumptions as you go, then print them out at your leisure.

Sidekick is available from many dealers in unprotected and protected versions.

IBM JX hard disk

At last we hear IBM have announced a hard disk option for their JX.

What it means is that the JX has become a potential solution for the small to medium size business running packaged accounting software.

Be aware though that the JX is not 100% IBM PC compatible.

Last we heard on price was in the region of $7,300 for 10 MB and 256 RAM. Availability ... IBM hasn't said but we would expect to see something within 4 to 6 weeks.

Job costing/estimating

We have had many enquiries from contractors for an estimating/job costing package that will allow integration from a creditors system and report on Quantities and Value vs Estimate. Do you think we can find any product!

There is a dirth of good job costing software in Auckland, which is surprising when you consider the number of small businesses where it would be appropriate.

If you are contracting and are still awaiting the release of suitable software, bear with us. MicroLab has made enough noises to ensure this void will be filled. Await further information in this column.

Hard disk/streaming tape devices

There has been considerable improvement in abilities and price reduction of units. These allow vastly increased data storage together with suitable back-up mediums.

As hard disk capacities have increased there has been a growing need for a solution to the traditional backing up method involving 360KB diskettes.

Shortly we will see a streaming tape back-up device as a standard element of a microcomputer where large disk capacity is required. In fact some manufacturers have produced a slimline unit that will fit inside your standard PC box.

For under $5,000 there is an external 25MB hard disk with 20MB back-up device available now.

Back-up duration will be cut by two - thirds.

Roll-on new technology and let us see the end of 360KB diskette back-up, so that our over-worked operators can get home in time for tea.■

In this regular column we keep the business person in touch with developments in the microcomputer industry.

The research reports are from Phil Ashton and Grant Furley at MicroLab, a "neutral" d.p. consultancy established by the accountancy KMG Kendons, in Auckland.

Going for business market

by Mike Cooch,

Marketing Manager
Commodore Computer NZ Ltd

Probably the first thing someone would say, if asked "What do you know about Commodore, the computer company", would be – they're big in home computers.

And that's absolutely right. But there's more to Commodore than that. Commodore is a business computer company, now more than ever.

While there is some debate about who was first in the computer race, it is clear that Steve Jobs and Steve Wozniak of Apple and Chuck Peddle of Commodore were all concocting explosive materials in garages at about the same time.

Commodore introduced an 8K computer with built-in screen and datasette in 1977 as the world's first self-contained personal computer.

Within four years, that decision had been justified as computer sales quickly became Commodore's major source of revenue, no small change bearing in mind that Commodore had been involved in manufacturing and marketing consumer products such as watches and calculators, office equipment and electronic components through its MOS Technology Subsidiary (developers of the 6502 CPU chip subsequently used by both Apple and Commodore) since its formation in 1958.

Squared off

During 1980 and 1981, Commodore's direction became firmly focussed on business system solutions with the introduction of the Commodore 4000 and 8000 systems.

Commodore had squared off against Apple for a share of this business market. In the U.S., Apple were a much more effective marketing unit, understanding that the key to success was distribution and effective marketing.

Commodore had an excellent product without doubt, but the wrong marketing approach for the US market. In Europe Commodore sensed the real potential of the business market and rapidly became the number one small business computer supplier in Europe.

Computer system sales had catapulted from 49% of total revenue in 1979 to 76% in 1981.

Commodore's philosophy was to become vertically integrated.

The concept of vertical integration meant that just about every important part contained in a Commodore microcomputer, beginning with the semiconductor integrated circuits and ending with the cabinets in which the entire computer mechanism is housed, was designed and built by Commodore.

This means that present and future needs for critical components can be matched with an assured and competitive supply.

By designing its own chips, designs could be tailored to the specific needs of the company's products to provide optimum trade-offs between performance and cost.

And finally, this structure provided efficient communication between design and production, thus reducing time from concept to final product.

By 1982 in New Zealand, Commodore had achieved a real presence with 20% of the unit installed base for business computers.

Branch became tree

But an idea in the early 1980s was to change Commodore's direction. A colour computer for under US$300. Impossible, inconceivable. Commodore had decided to maintain its momemtum in the small business market and to branch into the home computer business.

That branch rapidly became the tree as the phenomenon of the VIC-20 began a whole new way of thinking.

The success of this unit caused a wave of entrants into this market and venture capitalists clearly saw the opportunities of the home industry.

The VIC 20's successor, the Commodore 64 was an instant winner in the home and education markets, and while Commodore was still selling business systems, its emphasis was in the mass market.

Meanwhile, Apple was moving upmarket. On the heels of the Apple II came the Apple III and the Lisa.

While for various reasons these elegant products were not highly successful, they did establish Apple's direction in the business and professional markets.

During this period, another phenomenon occurred which placed pressure on Apple, but from which the bulk of Commodore sales was protected – the IBM PC.

Suddenly it had to be 16 bit and MS-DOS.

A standard was created which looks to be firmly entrenched, if for no other reason than the vast software base established.

Over a four year period, the IBM standard induced a large number of hardware companies to produce compatibles, some with faster clock speeds, some with colour graphics as standard, some with more memory than others, but all dutifully retaining varying degrees of compatibility.

It has to be said that even though all compatibles are equal, some are more equal than others.

Re-entry

It was during 1985 that Commodore Business Machines took the decision to re-enter the business market aggressively with the German designed and manufactured Commodore PC-10 and PC-20 capable of fully emulating the IBM PC.

Later in 1985, Commodore introduced two new products, the Commodore 128 and the commodore Amiga.

It is clearly evident that these systems challenge the Apple II Series and the Mac – so the wheel has turned full circle.

Apple and Commodore are set to square off yet again.

So after pursuing a different strategy for some years, its major competitor in 1981 will again become one of its major competitors.

This year Commodore will deliver an IBM PC AT compatible which will act as file server for the PC's in the growing networking market.

The way the networking and multi-user micros are developing and establishing themselves as effective and economic solutions, the job of selling conventional (and in many ways old-fasioned) mini-computers will be neither enviable nor profitable.

The future for Commodore?

Times have been tough recently but new paths are set and the company's future is solid.

Commodore will continue as a price performance leader, taking advantage of its base of high techology and vertical integration, in both home and small business markets. ■

If its news. . . ring Steven Searle, 796-775

"Psycho-Killer, Q'est que c'est?"

by Richard Gorham

First-up this month is a look at a program that had me quivering with anticipation when I first read about it in overseas advertising blurbs.

"MIND PROBER" from self-professed expert systems experts, Human Edge Software Corp., boldly claims to allow you to "...probe a person's mind".

Hmmm. Shades of Dr Frankenstein.

Alas, when I received the program for review recently, it was not accompanied by electrodes attached to large copper cables terminated by RS-232C plugs. Sadly there were no leather straps to tie the unwitting candidate down with, and in fact there wasn't even your common old garden kite to attract the boundless static charges lurking around my colour monitor and divert them to our local parking ticket dispenser.

Aha, I thought in a blinding flash of intuition, perhaps there is more to this than meets the eye. And clutching the slim paperback accompanying the solitary diskette (available for most comon PCs and costing a mere $167, I hurriedly kicked my trusty PC-G into life.

In the twinkling of an eye (I kid you not), I had psychoanalysed all my acquaintances, friends, enemies, and favourite Coronation Street personalities.

Here is a message to all those aforementioned people.

Don't do it. Yes folks, in the true vein of other brilliant US inventions like the portable lie-detector that connects to your phone, the hidden wireless microphones that one can scatter liberally around business acquaintances' offices, and even the "moles" deviously hidden deep in your competitor's organisation, we have here an even more powerful weapon with which to wage the daily war on the business front.

It is in fact something that Marvel Comics have been working on for years – the means to read other people's minds.

Better than a 1950's advert for the Charles Atlas bullworker, this little gem lets you anticipate when 300lb bullies are about to kick sand in your face (you can now easily overpower them with your obvious mental prowess).

Let's hope Big Brother doesn't get any copies of this program, for this is an absolutely foolproof method of reading other peoples minds, and surely only a hop skip and a jump away from being able to control their minds too.

On the other hand, perhaps we should all chip in and buy a copy each for Reagan and Gorbachev for christmas – perhaps by allowing each other to know what the other is really thinking it might just play a part in preventing one of those little personality conflicts.

Then again, and on the whole, perhaps it would be a good thing to distribute "Mind Prober" liberally in enemy camps.. did you say something about my lack of purpose/positiveness/directness?

"IBM's-at-it-again!"

Another good candidate for Mind Prober would ppear to be IBM's marketing department(s).

Recent rumours on the "grapevine" have it that a new IBM PC is imminent.

All the signs are there...

From the carefully phrased "denials" from your local IBM rep to the triumphant crowing from PC compatible manufacturers in Taiwanaland ("more compatible than the yet-to-be-released IBM ZZ itself").

This time it appears that IBM's Portable Personal Computer (aka PPC) is being let out to pastures green.

All par for the course, you might well say.

However, unprecedented price cutting of existing stocks has this time heralded the portentous event – recently IBM announded to it's dealers that the recommended retail price of the PPC should be $2995, down from $4800.

A bargain if ever I saw one. But one that would probably not impress Joe Farmer, wilting under the onslaught of Rogernomics, who had the day before paid a scant 60% more than if he'd waited 24 hours longer.

In any case the replacement of the PPC by an allegedly "excellent" lap-top will be eagerly awaited.

IBM has watched the developments in this area of the market in much the same way as it did with the original PC – hopefully it will have profited by other companies' mistakes and release the basis of a truly portable but practical personal computer.

Plug-in IBM upgrade

Plus Corporation, a subsidiary of Quantum Corporation, has introduced HardCard — the first hard disk on an IBM plug-in board — which effectively upgrades an IBM PC or PC terminal to the performance of an IBM XT.

It allows companies to achieve the productivity gain hard disks make possible, without losing their current investment in PCs.

HardCard consists of a 10 Mbyte disk drive with electronics, controllers, file management and installation software, all on a plug-in card. It can be installed directly into an IBM PC expansion slot.

Scanner transmits directly to screen

Omni-Reader is a character reader that transfers data from a typed page into a computer at a rate of two to three seconds per line — more than twice the speed of a competent word processor operator.

The system works by passing a light sensitive linear array, called a reading head, across a line of text. As each line of text is scanned, it is displayed on the vdu.

It can be programmed to retain the format of data, particularly where tables of figures are being 'read'.

Omni-Reader won the award for the best British innovation of the year, awarded by the Sunday Times national newspaper. It is manufactured in the UK by Oberon International Ltd.

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Sprite animator

by B.A. Bridger

One of the pleasures of programming a Spectravideo is the ease with which sprites may be moved around the screen and collisions detected.

This program, by Laurence Hodson, makes designing sprites very easy. The calculations are all done for you and once a sprite has been constructed it can be rotated and also mirror images formed.

If you have designed a number of sprites with the idea of having an animated figure then the sprites can be displayed in sequence to give an indication of how the animation will look in your program.

The instructions are detailed and easy to follow but if you have difficulty there is an option to have the designing process demonstrated on screen.

Sprites may be saved to tape and loaded back in for redesigning or incorporation in your program.

The screen layout is excellent. There can be a lot of information on screen simultaneously – the current sprite, the number and colour of the current sprite, sprite data and list of options – available but the screen has ann uncluttered and professional appearance.

Versions are available for SV-328, expanded SV-318, and 64K MSX computers, and are from Action Computers,

A few people have asked how to easily create sprites which are identical to the characters in the compute character set. It's quite simple, provided you know where in rom the character set resides.

Here's how it's done.

```
10 SCREEN 1
20 FOR I=&H4198 TO &H4550 STEP 8
30   FOR J=I TO I+7
40 A$=A$+CHR$(PEEK(J) )
50 NEXT
60 SPRITE$(1) = A$
70 PUT SPRITE 1, (128,96),7,1
80 A$=INPUT$(1) : A$=""
90 NEXT
```

The SVI character set is from 4198h to 4550h in rom. Each character takes 8 bytes, each byte corresponding to one of the 8 rows required to build the full character.

For MSX change the 4198 to 1BBF, the 4550 to 23B7, and the SCREEN 1 to SCREEN 2. The program will show every character on screen as a sprite, 1 at a time.

Graph Presenter

This is an excellent program for displaying data in various forms – histogram, bar diagram, line diagram, pie chart.

Data is entered from the keyboard initially and then can be stored on and retrieved from tape or disk. Changes can be made as required to data or headings.

The picture can be saved and/or printed.

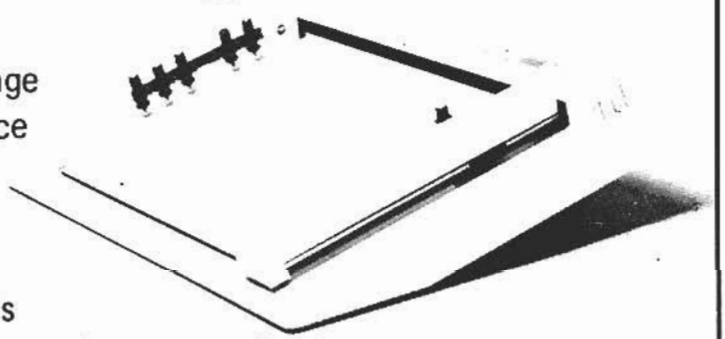
I have not found an upper limit to the number of points which may be plotted but above about 15 the graph starts to look crammed. Up to 4 comparisons may be made within each item plotted.

The instructions supplied with the program are detailed and comprehensive and necessary for the first couple of runs through data entry.

Two of the not so good features are that the last line of a graph is not printed until either the next picture is asked for or an LPRINT command is given after ending the program and also, after plotting a graph on screen and deciding to print it the graph has to be plotted again before it can be printed.

The programm is available for a SV328 or a SV318 with 16/64K expansion and also for a 64K MSX System. Costs $24.95, from Action Computers.

SEKONIC SPL-400 X·Y PLOTTER



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More keywords to stretch Basic

In the two previous D-I-Y articles, the operating system and keywords were discussed.

In this third article, more keywords and routines are covered, mainly sprite related.

If you've done as I suggested last issue, you'll have made a memory map of the overall system you're going to use. This is advisable because you can then use only the words you need for perhaps a particular program.

Eventually, you could finish up with several versions of the extended BASIC, each with an *ad hoc* application.

To that end, I'll present the routines, and leave it to you to use them, or not, with the operating system.

Remember that the routine addresses I use may not necessarily correspond to the addresses you'd use, i.e. if only some of the routines are implemented, ideally the extended BASIC you make up would be put into as little memory as possible.

So, if I show a routine at $C600, and you choose not to enter any other routines, the $C600 routine should be moved down to $C420.

Keep an eye on absolute addressing.

All keywords are being shown in their source code format, so that a) they can be typed into memory directly, b) they can more easily be relocated, and c) they are more understandable.

If you decide to use a bunch of these routines, the error branches can point to a common LDA/JMP, thus cutting 5 bytes off the routine length.

The error message is always ILLEGAL SPRITE ERROR, enough to let you know that there is something wrong with the statement.

There is an economic method of error indexing, which offers the choice of two messages. Say a routine could have two sources of error, like many of the routines below, and depending on the error, message #4 or #5 should be called up.

The uneconomic way would be as Routine 1.

An alternative is as Routine 2. Note that the BCS in Routine 2 appears to jump into the middle of an instruction. It actually lands on LDA#$05.

If message 4 is called, the BIT$05A9 after LDA#$04 merely does a non-destructive test of bit 6 of $05A9.

For the sake of simplicity, only an ILLEGAL SPRITE message is used in the sprite commands.

For all of the routines, the error checks could be left out, speeding up the keyword execution. You'd need to ensure that all statements were legal – not difficlut for a reasonably good programmer.

Some of the commands can produce misleading error messages in FOR-NEXT loops in one line. If they do, spread the loop on to 2 or 3 lines.

Another peculiarity, found in some other extended BASICs, is the need for a colon after THEN, eg IFA=1THEN:SCOL6,14.

The three examples show the speeds of different writing styles. Take note all those people who don't use variables! Admittedly (1) is marginally faster than (2), but (2) has the advantage of being more readable, which is helpful for debugging. It also uses less BASIC memory space.

If the loop is enlarged to contain more statements, conventional BASIC becomes comparatively slower.

Example (3) is a very inefficient, but common, programming style.

D-I-Y BASIC – Part Three

```
Routine 1
0000 CMP#$00    ;
0002 BNE$0009   ;message 4
0004 CPX#$08    ;
0006 BCS$000E   ;message 5
0008 RTS        ;
0009 LDA#$04    ;
000B JMP$ERROR  ;
000E LDA#$05    ;
0010 JMP$ERROR  ;

Routine 2
0000 CMP#$00    ;
0002 BNE$0009   ;message 4
0004 CPX#$08    ;
0006 BCS$000C   ;message 5
0008 RTS        ;
0009 LDA#$04    ;
000B BIT$05A9   ;
000E JMP$ERROR  ;

  SPVi,y      position sprite i at vertical y
  SCOLi,y     sprite i,colour y
  SPXi/DEXi   sprite i X expand/unexpand
  SPYi/DEYi   sprite i Y expand/unexpand
  PAGEi,y     pointer i,y (cf POKE2040,192 etc)

SPVi,y
C4FD JSR$B7EB   ;evaluate
C500 CLC        ;
C501 LDA$15     ;test for
C503 CMP#$00    ;y > 255
C505 BNE$C514   ;error
C507 LDA$14     ;test for
C509 CMP#$08    ;i > 8
C50B BPL$C514   ;error
C50D ASL        ;double index
C50E TAY        ;
C50F TXA        ;
C510 STA$D001,Y;
C513 RTS        ;
C514 LDA#$04    ;ILLEGAL SPRITE
C516 JMP$C2F0   ;

SCOLi,y
C519 JSR$B7EB   ;evaluate
C51C CLC        ;
C51D CMP#$00    ;test colour>255
C51F BNE$C52D   ;error
C521 LDA$14     ;test for
C523 CMP#$08    ;i > 8
C525 BPL$C52D   ;error
C527 TAY        ;
C528 TXA        ;
C529 STA$D027,Y;
C52C RTS        ;
C52D LDA#$04    ;ILLEGAL SPRITE
C52F JMP$C2F0   ;

SPXi
C53A JSR$AD8A   ;evaluate
C53D JSR$B7F7   ;
C540 CMP#$00    ;
C542 BNE$C553   ;error
C544 CLC        ;
C545 CPY#$08    ;
C547 BCS$C553   ;error
C549 LDA$C558,Y;get mask
C54C ORA$D01D   ;set bit
C54F STA$D01D   ;
C552 RTS        ;
C553 LDA#$04    ;
C555 JMP$C2F0   ;
C558 01 02 04 08 10 20 40 80

SPYi
As per SPX, using $D017 instead
of $D01D.

DEXi
C580 JSR$ADBA   ;evaluate
C583 JSR$B7F7   ;
C586 CMP#$00    ;
C588 BNE$C599   ;
C58A CLC        ;
C58B CPY#$08    ;
C58D BCS$C599   ;
C58F LDA$C59E,Y;get mask
C592 AND$D01D   ;clear bit
C595 STA$D01D   ;
C598 RTS        ;
C599 LDA#$04    ;
C59B JMP$C2F0   ;
C59E FE FD FB F7 EF DF BF 7F

DEYi
As per DEX, using $D01D instead
of $D017.

PAGEi,y
C5B0 JSR$B7E7   ;evaluate
C5B3 CLC        ;
C5B4 CMP#$00    ;test y
C5B6 BNE$C5C4   ;
C5B8 LDA$14     ;
C5BA CMP#$08    ;test i
C5BC BPL$C5C4   ;
C5BE TAY        ;execute
C5BF TXA        ;
C5C0 STA$07F8,Y;
C5C3 RTS        ;
C5C4 LDA#$04    ;
C5C6 JMP$C2F0   ;

Example 1:time=168 jiffies
10 V=53248:V1=53249:POKEV+32,0
20 POKEV+33,0:POKEV+21,1
30 POKEV+39,1:POKEV+23,1:POKEV+29,1
40 TI$="000000"
50 FORI=32TO255
60 POKEV,I:POKEV1,I
70 NEXT
80 FORI=255TO32STEP-1
90 POKEV,I:POKEV1,I
100 NEXT:PRINTTI

Example 2:time=176 jiffies
10 BDR0:BCK0:SEN1
20 SCOL0,1
30 SPX0:SPY0:A=1:TI$="000000"
40 FORI=32TO255
50 SPH0,I:SPV0,I
60 NEXT
70 FORI=255TO32STEP-1
80 SPH0,I:SPV0,I
90 NEXT:PRINTTI

Example 3:time=445 jiffies
10 POKE53280,0:POKE53281,0
20 POKE53269,1:POKE53271,1
30 POKE53277,1:POKE53287,1
40 TI$="000000"
50 FORI=32TO255
60 POKE53248,I:POKE53249,I
70 NEXT
80 FORI=255TO32STEP-1
90 POKE53248,I:POKE53249,I
100 NEXT:PRINTTI
```

Some notes on Riteman C+

by Joe Colquitt

The Riteman C+ is a versatile, inexpensive, Commodore compatible printer. It was for these reasons that I changed to it from my Commodore MPS802.

Although the manual is quite comprehensive, there are a few things that could bear explaining.

Before I go on, I'd like to apologise for a mix-up in the October article concerning the User Port lines. Port B is 56577, and its I/O register is 56579.

If a bit in 56579 is on, the corresponding bit in 56577 is set as an output. So, for example, POKE56579,129 sets PB0 and PB7 as output lines, and PB1-PB6 as input lines, which can be read by PEEK(56577).

The first thing that interested me about the C+ was that the printer has such a large buffer for holding re-defined data for bit-mapped printing.

If you saw my October article on bit-mapping for the MPS802, you'll recall that it was quite a large chunk of machine-code. This is primarily because the 802 has only an 8-byte buffer for user graphics, and the MC is needed for speedy transfer of data from computer to printer.

Not so with the C+.

Although a little MC is required to rotate the bitmap characters, the printer can store enough data to print a 40 character bitmap line, at an acceptable speed, in BASIC.

The MC, reproduced below, is not relocatable, as it is self-modifying, but it should be out of the way at $C000 (49152).

To print a bitmapped screen, first the bitmap must be at $6000 (24576). If the particular screen you want to print is somewhere else, just use a FOR..NEXT loop to move it, eg if it was at 8192, use:

```
FORI=0T07999:POKE24576+I,PEE
K(8192+I):NEXT
```

Next put the C+ into PLUS mode, ie DIP switch 2 off, switch 3 on. Load the output program and RUN.

Output program 2 can be used for printing a screen of redefined characters, whose data is between 12288 and 16384. Draw or load the screen into 1024-2023 and run the program.

It calls a routine in BM ML which converts the redefined screen to a bitmap screen at 24576 and then outputs it to the printer.

Word processing

The second point worth noting is word-processing on the C+ using Easyscript.

Normally, this program on Commodore settings will not produce enchanced scripts, such as 132 column printing, double-width, italics etc.

Using Easyscript in Serial Epson mode will make these features available.

Load EASYSCRIPT and set switch 2 off, switch 3 on. When answering the introductory prompts for Easyscript, enter '1' for printer type, and 'S' for interface type. If you have an original copy of Easyscript, you'll find an MX80 file on side 1 of the disk (remember you can clip side 2 and use it). This contains most of the information below.

Function	On	Off
Enhanced	f1 [	f1]
Emphasized	f1 (	f1)
Underlined	f1 ;	f1 :
Double print	f1 &	f1 %
Condensed	f1 <	f1 >
Italics	f1 4	f1 5

Superscripts f1 ' per ss character
Subscripts f1 , per ss character
eg 10^{-3} was typed as 10 f1 ' – f1 ' 3 f1 %
eg H_20 was typed as H f1 , 2 f1 % 0

The f1 % is to turn off double print mode, which, by some quirk, is turned on by super/subscript mode. If you don't do this, all printing after a ss will be darker.

NLQ mode

I've had a few enquiries about NLQ mode and Easyscript. Apparently if you had bought an earlier C+ and later had NLQ fitted, it was difficult finding out how to access NLQ.

The NLQ manual provides several clues with regard to escape codes, and these just need to be put into Easyscript as Format codes.

Using these codes, all fonts and modes are accessible.

Many thanks to Richard Doull for pointing out the similarity between Easyscript and Speedscript, which put me on the right track. These format instructions are to be used in Epson mode, as for the previous examples.

Page 8-10 of the ES manual and page 3-52 of the NLQ addendum are the link.

Section 8.2.11.2 describes the use of special characters, and here is how to use them to turn NLQ on/off in Easyscript.

First, define your special characters at the start of your document, like this:

F3 0=27:1=88:2=0:3=1 [return] (88 is the ASCII for X)

When you want to print a section in NLQ, preface it with:

F1 0 F1 1 F1 3 (ie CHR$(27); "X"; cHR$(1))

To turn NLQ off, use:

F1 0 F1 1 F1 2 (ie CHR$(27);"X";CHR $(0))

By using this logic, any escape code in the PLUS mode section of the C+ manual can be inserted into Easyscript.

Because the C+ and Easyscript are both so versatile, there are many features that could be exploited by various means, and hopefully some of the conventions presented here will help you write classier documents. ■

Print Shop

by Andrew Mitchell

It really turns you computer and printer into an extremely useful combination.

There are six major choices:

Greeting Card — the option to make a 'french-fold' card for any special occasion. You choose the border, the graphic picture and its size, the layout of that graphic, a message and the style of print all for the front. Then you repeat the process for the inside of the card. There is also an option to print ready-made cards.

Sign — this is a full page notice which only your imagination will limit. Again you choose the border, use of graphics, message and style of print.

Letterhead — again the variations are almost limitless.

Banner — This prints your message lengthways along your paper. It can be used very effectively, along with graphics; but beware, it uses your paper supply very rapidly.

Screen Magic — This is a bit of a fun section but could still have its serius side. The programme generates a kaleidoscope pattern (there are 12 in all) which can be frozen at any point. You can then add text and print the result.

Graphic Editor — allows you to create your own graphics or modify any of the 60 graphics held by the programme. It is these graphics that you use when working on the previous options, so your selection is very wide.

When Print Shop first arrived for the Apple it was hailed as 'the' programme for schools. They could customise their correspondence and make interesting posters for various school functions.

This programme, at $99.50, is excellent value for money and I can foresee it becoming a big seller, especially as I guess there will be a special price for schools and even some businesses. On disc only.

The uses of Teletext screens

by Pip Forer

I started off this month with the intention of nominating my top-ten of useful software.

I abandoned the idea for two reasons.

Firstly, usefulness is very much in the eye of the user: what is useful to me may well be useless to you (and vice versa).

Secondly, such a list can be misleading. By definition useful programs are those that have been used for some time. A program that was bought over a year or two ago and still satisfied a need may nevertheless not be the best option for a user coming to the marketplace in 1986, tried and true though it is.

However, before I abandoned the top ten, one product had appeared on it which made me think a little about my own prejudices in programming.

This product is the Teletext (Mode 7) screen editor from Beebugsoft.

I have always tried to avoid Mode 7 like the plague. Partly this is because its use is far less instinctive (and far less well explained) than the other modes on the BBC Micro. Partly it is a psychological problem (who, me?).

Some farmers who have cleared bush to make grazing have felt unwilling to reinstate trees on marginal land because it betrayed their first clearance ethos. I, having risen above the screen limitations of earlier micros, was unhappy to revert to a text style screen.

The Teletext editor started off by making teletext easy for me to use and by doing that freed me of those earlier prejudices I had enjoyed.

How Mode 7 works

On the BBC the teletext mode has the unique ability to give you eight colours and 40 characters per line. It also only uses 1k of memory.

It manages this trick in a very simple way, but one which its relatively low exposure will justify retelling (at least for some).

A teletext screen consists of 25 lines of 40 characters. Each line is scanned separately and displayed on the screen using a special Teletext chip (not the usual BBC graphics chip used for other modes).

Characters are interpreted sequentially one by one, with a clean break between lines. The significant word here is interpreted: teletext characters are not just letters and numbers but also command codes which affect other characters following on the line.

The codes used follow an international standard but differ from normal ASCII codes. This is shown in the BBC Users Guide where two tables display the effects and letters associated with different numeric values: the ASCII and teletext tables.

The BBC uses ASCII codes between 0 and 128 for most normal operations in modes 0 to 6, and uses the spare codes over 128 for special characters and other uses.

The Teletext table reveals a similar structure for characters but with a fully defined use of codes 128-255, including a rather important section of codes between values 127 and 159.

This group issues commands which affect the display of other characters.

To complicate the tables further there is a second set of characters which can be made to appear: the graphics characters (which actually include some missing features from the other set such as the three-quarters figure).

Commands

Amongst the command codes are ones that set text colour, determine whether you display alphabetic or graphics characters, produce double height characters, make characters flash and so on.

Each command takes up one byte of the screen (which gets displayed as a blank of the current background colour, so you often do not get a full 40 characters that you can use. Setting a cyan background with blue text, for instance, needs three spaces.)

Working interactively with Teletext screens can be awkward because changing something at one point can affect the rest of the line (and that point can be an innocuous looking space that may conceal a control character).

With teletext you can produce the well-known and quite attractive screens typical of Prestel.

Because they are low on memory use you can write large programs, or even use tricks like altering the address that defines the start of video memory to run more than one screen at once (teletext can be formatted to make very effective help screens).

There are public-domain programs to printer-dump mode 7 screens that can catch everything except the flash.

Why then is mode 7 sometimes ignored?

The problem is that to use teletext effectively the user has to get involved in producing printing effects using the CHR$() command to embed all the codes that the keyboard can not generate (with the exception of the rather neat use of the 'shifted' special function keys to set text colour).

But the teletext editor lets you get round this.

With the Beebugsoft editor (which is not the only one available but which I have found adequate) you get a good, interactive tutorial on teletext to start you off.

The main editor provides a full summary of commands available and the ability to handle up to 4 screens at one.

Editing is through use of the special function keys (which produce the required teletext command codes), with enhanced control of the editing keys and some extra feature such as a large, bold type for significant title pages provided.

You simply move around the screen printing and painting what you want where you want it.

Given the nature of teletext this can still be messy for graphics but it is outstandingly simple for designing good screen prompt pages.

Saving bonus

The real bonus lies in the options for saving your screen.

You can opt to save any screen as a screen image which can then be * LOADED from any program of your own.

This has limitations in some cases however.

The other option is to save the screen as a procedure.

The editor will translate your image into suitable PRINT statements for a procedure you both name and specify the line numbering for.

This is spooled into a file which can be EXECed back into any program. This is a real treat because minor alterations can be done without reverting to the editor at all.

This ability to interactively create a screen and graft a known layout into one's programs alters one's attitude to teletext a great deal.

I now intermix Mode 1 and 7 screens quite frequently (remembering to set HIMEM to the bottom of the most demanding mode's screen memory at the program's start and not to change mode during a procedure). The key is the ease with which it can now be done.

Of course teletext is also the basis of public information systems like Prestel, Editel and Ceefax.

More fun with disks: Recovering deleted files

by Paul Left

In a previous column we dealt with using a sector-editor to alter information on a disk.

We looked at how to read the Directory on track $11, sector $OF to find the location of a file, and how to alter that file by reading in, modifying, and re-writing the appropriate sectors.

The example we used was of a text-file which had been overwritten with an almost-empty file of the same name.

This month we will look at how to recover a file which has been lost through the DOS 3.3 DELETE command. This will necessitate a closer look at the Directory and how file-names are stored there.

It is important to bear in mind, however, that once a file has been DELETED, it must be 'un-deleted' before other files are saved to disk, or it will be lost forever.

If you have saved other files, however, your deleted file may still be safe, so give this method a try anyway.

The steps we will use are as follows:

(1) Alter the Directory or CATALOG entry for the file to show that it is still current.

(2) LOAD the file into memory and SAVE it again to make sure DOS knows the file's sectors are in use.

Before you get started, make yourself a practice disk to avoid damaging files on existing disks. To do this, load a BASIC program into memory, put a BLANK disk in drive 1, and type INIT GUINEA PIG.

This will format the new disk and place the BASIC program on it as the 'start up' program. Now type SAVE FILE TWO. This will save another copy of the same program to disk, and you should see both names when you do a CATALOG.

Now type DELETE FILE TWO, and then do a CATALOG again. FILE TWO should have disappeared from the directory, and is inaccessible to DOS commands such as LOAD, RUN, etc. Your practice disk is now ready.

Now boot your favourite sector-editor and read in the directory on your practice disk. If you took notes last time, you'll know that it's found on Track $11, sector $OF. You should see something like Figure 1:

FIGURE ONE
TRACK $11, SECTOR $OF

```
00: 00 11 0E 00 00 00 00 00   ?QN?????
08: 00 00 00 12 0F 02 C7 D5   ??????GU
10: C9 CE C5 C1 A0 D0 C9 C7   INEA PIG
18: A0 A0 A0 A0 A0 A0 A0 A0
20: A0 A0 A0 A0 A0 A0 A0 A0
28: A0 A0 A0 A0 04 00 FF 0F       ????
30: 02 C6 C9 CC C5 A0 D4 D7   ?FILE TW
38: CF A0 A0 A0 A0 A0 A0 A0   O
40: A0 A0 A0 A0 A0 A0 A0 A0
48: A0 A0 A0 A0 A0 A0 13 04         ??
50: 00 00 00 00 00 00 00 00   ????????
```

Notice that FILE TWO still appears in the directory, along with GUINEA PIG. Let's look at the information about the files, starting from the beginning of the sector. Firstly, the '11 OE' tells DOS where the next directory sector will be found when this one gets full. After a string of '00' bytes comes the beginning of the directory entry for the first file.

The '12 OF' tells where its track/sector list is found, the '02' tells what sort of file it is, and then come the file name itself. This is padded out to 30 characters by a string of 'A0' bytes, which is the hex code for a 'space' character.

Then come the file length ('04') and a '00' byte to signal the end of the entry. In other words, the entry comprises:

2 bytes that show the track and sector of the Track/Sector List;

1 byte that shows the file type;

30 bytes which are the file name;

1 byte which shows the number of sectors the file uses;

1 byte, always '00', to show the end of the entry for that file.

Now DOS normally would have saved the next file on sector $0F of the next track, $13, but the first byte of this entry is 'FF'.

Look at the last few bytes of this entry, and notice that the length, '04', is preceded not by an 'A0' but a '13'. This is the track number of the deleted file's track sector list.

This is the clue to what DOS does when it deletes a file: it moves the first byte of the entry for that file to just before the file length byte, and replaces it with an 'FF'.

The original data in the file itself is still intact, but DOS notes elsewhere that the sectors occupied by the file are now available, and they will be overwritten in time by SAVEing other files.

In the meantime, however, we can easily recover the file by altering these two bytes back to their former values.

As long as you haven't saved other files to disk, the file should be intact.

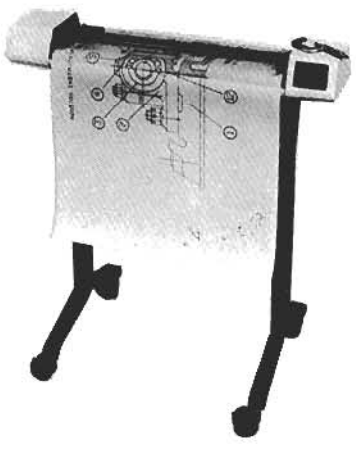
Change the 'FF' back to '13', therefore, and change the '13' near the end of the entry back to 'A0'. The sector should now look like figure 2; if it does, write the sector back to disk, and your file will be rescued.

FIGURE TWO
TRACK $11, SECTOR $0F

```
00: 00 11 0E 00 00 00 00 00   ?QN?????
08: 00 00 00 12 0F 02 C7 D5   ??????GU
10: C9 CE C5 C1 A0 D0 C9 C7   INEA PIG
18: A0 A0 A0 A0 A0 A0 A0 A0
20: A0 A0 A0 A0 A0 A0 A0 A0
28: A0 A0 A0 A0 04 00 13 0F       ????
30: 02 C6 C9 CC C5 A0 D4 D7   ?FILE TW
38: CF A0 A0 A0 A0 A0 A0 A0   O
40: A0 A0 A0 A0 A0 A0 A0 A0
48: A0 A0 A0 A0 A0 A0 A0 04         ??
50: 00 00 00 00 00 00 00 00   ????????
```

Exit from your sector-editor, and CATALOG the disk. You should find the

COMPLETE GRAPHICS
-the Houston way-



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file back in the directory, safe and sound.

However, a few lines back I said that DOS records that a deleted file's sectors are available for new files, and unless we fix this, our 'undeleted' file can still be overwritten. There are two methods of dealing this, but the simplest is to LOAD the file and SAVE it again.

This is easily done from DOS if the file is a BASIC program, but needs to be done from within a word-processor if it is a Text file.

If it's a Binary file, BLOADing is easy, but you need to know the file's Start address and Length before BSAVing it.

If you don't know these details, you will need to read in the first sector of the program with your trusty editor.

Remember that you can find this sector by looking at the Track-Sector List of the file.

The first 2 bytes of the file itself are the address and the next 2 are the length. Both have the bytes reversed; that is, in the example in Figure 3, the address is $0400 and the length is $1842. After BLOADing this file, you would BSAVE with "BSAVE filenames, A$0400,L$1842".

Be aware, however, that only Binary files have the start address and length stored in this fashion.

FIGURE THREE
First Sector of a Binary File

```
00: 00 04 42 18 A9 01 60 C5
    ----- -----
      ^     ^
   start   length
    of      of
   file    file
  $0400   $1842
```

Once you have saved your file back to disk, experiment with the files on your practice disk: you can't mess around with all of the bytes in the directory, but the 30 bytes of the file name are fair game.

If your editor lets you enter text, write directly over the file names.

If your editor will only let you enter hex values for the bytes, you'll need to translate the characters you want to enter into their haxadecimal ASCII codes.

You can enter control characters, which are invisible to a normal CATALOG, and make your file inaccessible to anyone who doesn't know about the invisible characters.

Try replacing the $A0 bytes (spaces) with $88 (backspace) or $8D (carriage return) bytes. These can alter the whole screen format of your CATALOG if you're so inclined, but if you change the name of your 'HELLO' file, you need to tell DOS the new name.

See if you can find the correct bytes to change on Track $01, Sector $09. This is the only way to change the 'HELLO' file's name without re-initialising the disk.

While you're still experimenting with your practice disk, try changing the file-type byte and see what effect each of the following legal values has:

00	80
01	81
02	82
04	84
08	88
10	90

In future columns we'll look at altering DOS to gain extra disk space for your files.

In the meantime, take care when working with anything other than a practice disk.

Always make a backup before you start, and check through your alterations before you write a sector back to the disk. ■

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Moving simple shapes

by Dick Williams

You will recall that last month I started this series on shape movement with a program to create simple shapes consisting of up to nine points.

Each point could be plotted on screen, numbered, and joined up to make a visible shape.

The program this month takes that a stage further and shows the nett effect of applying simple mathematical functions to the points.

The accompanying screen dumps show an original image, and how it can be moved left or right, scaled and rotated. This is a demonstrationn program and has point identification plus point x,y on screen, and also an off centre status indicator. These make it a lot easier to follow the program and to see what happens to each point. For example, when moving a shape to the right by 20 (20 pixels) all x co-ordinates increase by 20.

If a shape is scaled to half size (.5) both the x and y value of a point are halved so the points come in closer to the origin (x=0, y=0) and the shape gets smaller.

Rotation of a shape requires the x and y values to be multiplied by the sine and cosine of the rotation angle, plus a variable added or subtrated. Lines 590 to 640 show this.

The Sega sine and cosine tables apply to radians, and it is necessary to convert degrees to radians prior to starting the rotation calculation.

The Sega shows a very small difference in the sin and cos of 45 degrees – where it should show the same value to I have reduced this error by making the sine value equal to the cosine of 90 degrees minus the angle required. This means that it is only using its cosine table, see line 600. Because of the on screen particulars the program is quite slow at erasing and redrawing the shape at a new location.

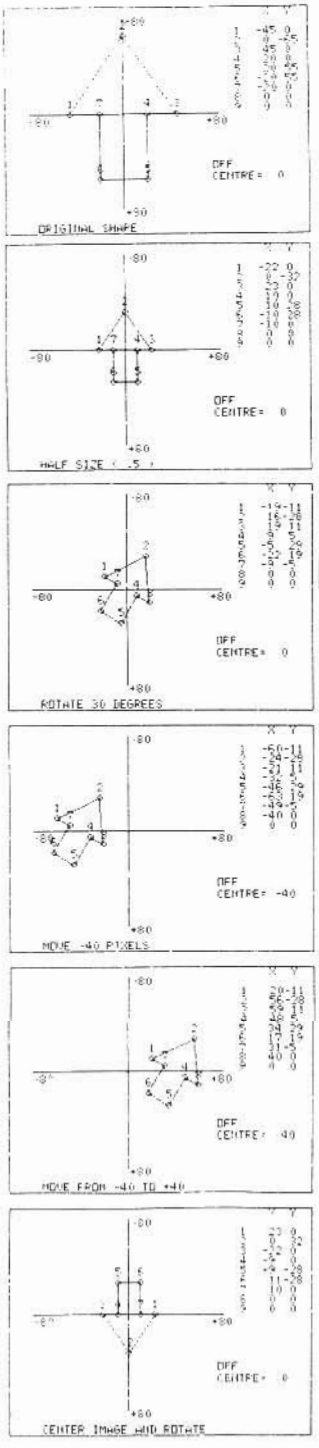
Even with the code parred right down to the absolute minimum, the speed is still slow. So that you can see something really fast there is a short machine code program included. This is for 16/32k cart or disc and shows the Sega at high speed printing a whole screen.

A practical method is to use basic most of the time for the parts which do not need a lot of speed and to use machine code routines (short sections) for those parts which do.

With the shape movement program there are things to remember: the x=0 and y=0 positions are no longer at top left, they are positioned at the centre of the screen; in the interests of keeping the code short, I have used equations to modify each of the x,y point co-ordinates – a more sophisticated method would use the mathematical technique of matrix transformations; an image scaled down to a very small size and then re-scaled up will distort due to small errors in the calculation process.

```
10 REM  NAME = GRAPH 2      D WILLIAMS
   Experiments with graph movement
20 REM--Set up graph screen----------
30 ERASE : SCREEN 2,2:CLS:A= -90:B=93
40 POSITION (100,90),0,0 : J=1
50 GOSUB 800
60 CURSOR -80,3    :PRINT "-80
70 CURSOR  70,3    :PRINT "+80
80 CURSOR   2,-80 :PRINT "-80
90 CURSOR   2, 80 :PRINT "+80
100 PATTERN S#0, "F0C0A0900804020 1
110 CURSOR A,B : COLOR 1
120 PRINT "MOVE=ARROW KEYS,CR=PSET,J=D
RAW
130 CURSOR 118,-88 :PRINT "X  Y":PRINT
 :FOR P=1 TO 9 :PRINT TAB(30);P : NEXT
 :GOSUB 650
140 X=0 : Y=0 : REM ------------------

150 REM--PSET points on screen-------
160 Y$=INKEY$ : IF Y$ = "" THEN  BLINE
 (-80,-82)-(80,-90),1,BF:CURSOR-80,-90
 :PRINT "X =";X;"   Y =";Y
170 IF Y$ = CHR$(28) THEN X=X+5
180 IF Y$ = CHR$(29) THEN X=X-5
190 IF Y$ = CHR$(30) THEN Y=Y-5
200 IF Y$ = CHR$(31) THEN Y=Y+5
210 IF Y$ = "J" THEN 250
220 IF Y$ = CHR$(13)THEN PSET (X,Y),1:
 BEEP:CIRCLE (X,Y),2,1:CURSOR X-8,Y-12
 :PRINT J  : X(J)=X : Y(J)=Y :GOSUB 650
 :J=J + 1 : IF J > 9 THEN 250
230 SPRITE 0,(X,Y),0,1
240 GOTO 160 : REM loop back ---------

250 REM--Park sprite pointer top left
260 SPRITE 0,(-80,-80),0,1 : J=J-1
270 BLINE (-85,-90)-(20,-82),1,BF
280 REM--Join up points with lines---
290 PSET( X(1),Y(1) ) : FOR P=2 TO J
300 LINE -( X(P),Y(P) ) : NEXT
310 LINE -( X(1),Y(1) )
320 GOSUB 820
330 CURSOR A,B:PRINT CHR$(5);"M=MOVE S
=SCALE R=ROTATE C=RESTART":GOSUB 650
340 Y$=INKEY$:IF Y$ <> "" THEN BEEP
350 IF Y$ = "M" THEN 410
360 IF Y$ = "S" THEN 470
370 IF Y$ = "R" THEN 560
380 IF Y$ = "C" THEN 30
390 GOTO 340:REM----------------------

400 REM--Move drawing left or right--
410 CURSOR A,B:PRINT CHR$(5);" MOVE- T
YPE IN HOW FAR (+CR)   " ; : Y$=""
420 K$ = INKEY$ : IF K$ = "" THEN 420
430 IF K$=CHR$(13) THEN BEEP:GOSUB 720
  :K=INT( VAL(Y$) ):FOR P=1 TO J:X(P)=
  (X(P)+K):NEXT: MX=MX+K : GOTO 290
440 PRINT K$; : Y$=Y$+K$ : BEEP
450 IF INKEY$ <> "" THEN 450
460 GOTO 420 : REM ------------------

470 REM--Scale drawing larger/smaller
480 K$=INKEY$:IF MX <> 0 THEN CURSOR A
,B:PRINT CHR$(5);"SHAPE OFF CENTRE,PRE
SS CR TO RECENTRE":Y$=STR$(MX * -1):IF
 K$=CHR$(13) THEN 430
490 IF MX<>0 AND K$<>CHR$(13)THEN 480
500 CURSOR A,B:PRINT CHR$(5);" SCALE-T
YPE IN HOW MUCH (+CR)   " ; : Y$=""
510 K$ = INKEY$ : IF K$ = "" THEN 510
520 IF K$=CHR$(13) THEN BEEP:GOSUB 720
  :K=VAL(Y$):FOR P=1 TO J:X(P)=X(P) * K
  :Y(P)=Y(P) * K :NEXT: GOTO 290
530 PRINT K$; : Y$=Y$+K$ : BEEP
540 IF INKEY$ <> "" THEN 540
550 GOTO 510 : REM--------------------

560 REM--Rotate drawing clockwise----
570 K$=INKEY$:IF MX <> 0 THEN CURSOR A
,B:PRINT  CHR$(5);"SHAPE OFF CENTRE,PR
ESS CR TO RECENTRE":Y$=STR$(MX * -1):IF
 K$=CHR$(13) THEN 430
580 IF MX<>0 AND K$<>CHR$(13)THEN 570
590 N=30:CURSOR A,B:PRINT CHR$(5);"ROT
ATE SET AT";N;" DEGREES" : GOSUB 720
600 C=COS( RAD(N) ):S=COS( RAD(90-N))
610 FOR P=1 TO J: D = X(P)
620 X(P)=X(P) * C -Y(P) * S
630 Y(P)=Y(P) * C + D   * S
640 NEXT : GOTO 250 : REM ------------

650 REM--Print X and Y point values--
660 CURSOR 110,-80 : PRINT CHR$(5)
670 FOR P=1 TO 9
680 PRINT TAB(34) ;INT( X(P)+.5 );
690 PRINT TAB(37) ;INT( Y(P)+.5 )
700 NEXT
710 CURSOR 75,40:PRINT "OFF":CURSOR 75
,50:PRINT "CENTRE= ";MX : RETURN : REM

720 REM--Erase point numbers+circles-
730 REM
740 FOR P = 1 TO J :              BLINE
(X(P)+4,Y(P)-4)-(X(P)-4,Y(P)-12),1,BF
750 BCIRCLE ( X(P),Y(P) ),2 : NEXT:REM
760 REM--Erase previous drawing-----
770 PSET ( X(1),Y(1) ) : FOR P=2 TO J
780 BLINE -( X(P),Y(P) ) : NEXT
790 BLINE -( X(1),Y(1) )
800 LINE (0,-80)-(0,80),2
810 LINE (-80,0)-(80,0):COLOR 1:RETURN

820 REM--Print new point numbers-----
830 REM
840 FOR P=1 TO J
850 CIRCLE ( X(P),Y(P) ),2,1
860 CURSOR X(P)-8,Y(P)-12 : PRINT P
870 NEXT : RETURN
880 REM Change  REM in line 730 + 830
    to RETURN. This will stop drawing
    erasure and point numbering.
890 REM To scale;try values of .5 for
    half size and 2 or 3 to increase
    size. If the shape is too large to
    fit on screen when scaled up, the
    program will stop. A scale down of
    .001 gives a small dot in the
    centre;rescale 1000.
900 REM Rotation is preset to 30
    degrees by N=30 in line 590,alter
    to suit. Movement is restricted to
    left or right.  -40 moves left by
    40 pixels, +40 moves right from
    present position by 40 pixels. The
    + sign is not necessary
995 REM
    ------------ 0 ----------------
    -80                          +80
          <-------  -40 = left
          ------->   40 = back to 0
```

```
5 REM AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA

12 X=&H9808:REM PROG M/C/S D WILLIAMS
14 READ A$:IF A$="END" THEN 38
16 A$=LEFT$(A$,2):POKEX+S,VAL("&H"+A$)
   :D$=HEX$(X+S):PRINT D$;"  ";A$:S=S+1
   :GOTO 14
18 DATA 21,00,A0 LD HL WITH BUFFER
20 DATA 06,05    LD B WITH 5   (&H05)
22 DATA C5       PUSH B
24 DATA 06,C1    LD B WITH 193 (&HC1)
26 DATA 0E,BE    LD C WITH VDP
28 DATA ED,B3    OTIR
30 DATA C1       POP B
32 DATA 10,F6    DJNZ LOOP & DEC B
34 DATA C9       RETURN TO BASIC
36 DATA END
38 PRINT "NOW LOADING BUFFER
42 X=&HA000:FOR S=0 TO 949
44 POKE(X+S),42 : NEXT : CLS
46 X=&HA000
48 FOR S=0 TO 949 :B=PEEK(X+S)
50 B$=CHR$(B):PRINT B$;
52 NEXT:PRINT
54 INPUT "PRESS CR TO CLS";K$ :CLS
56 INPUT "PRESS CR TO PRINT ";K$
58 CALL&H9808
60 REM Type in and save.Try a run,if
   no mistakes the prog will load a
   buffer and print it to the screen
   at slow speed.Line 54 clears the
   screen,line 56 leads to 58 which
   calls a machine code to print at
   high speed.
62 REM You can delete 12 onwards and
   type CALL &H9808 to print anytime
   you feel like it.Printing takes
   place from the cursor position.
63 REM Notice that when the prog is
   run LINE 5 contains some strange
   characters.These represent the num-
   bers that are stored in memory
   starting from &H9808 and are the
   (computer) machine code controling
   the fast printing.
64 REM This is for cartridge users:For
   disc,alter as follows.
   LINE 12 X=&HB717.LINE 58 CALL&HB717
   Add LINE 40 LIMIT &HFFFF Alter LINE
   42 and 46 X=&HD000 LINE 18 DATA 21.
   00,D0
```



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Syncalc, Synfile and Syntrend

by Allan Clark

Syncalc, Synfile and Syntrend are three of a suite of programs produced by Synapse for the Atari home computers.

Syncalc is also available for the Commodore 64.

Both Syncalc and Synfile have recently been upgraded to take advantage of the extra memory of the Atari 130XE.

Syncalc

Syncalc is an electronic worksheet.

Have you ever planned a budget for your home or office? If so you have probably used a worksheet divided into rows and columns.

Perhaps you wrote the months of the year across the top of the sheet and listed categories of income and expenditure down one side.

After entering the basic information for each category for each month you may have calculated total cash available (or shortfall) by adding and subtracting numbers in each of the sheet's cells. This is the classic example of a worksheet.

Syncalc is an electronic version of the familiar paper worksheet.

Since it does all the calculations for you at lightening speed, and remembers the formulas used, an electronic worksheet is much more convenient than a paper one because it allows you to manipulate large amounts of information with minimum effort.

Syncalc comes attractively boxed with a fully detailed and illustrated tutorial manual.

Users who have used other worksheets will be immediately at home with Syncalc, while users new to electronic worksheets will find the manual friendly and easy to understand.

The pop-up menus also encourage a clear understanding of the principles of electronic worksheets.

On screen

On booting the Syncalc disk you are presented with a row of columns each named A B C ... etc. and row names 1 2 3 ... A3 refers to the cell at the intersection of column A and row 3.

The bottom of the screen has the message option = menu. Pushing Option brings up four choices load/save, text, numeric, command. Use the arrow keys to move the cursor to make your selection and hit return to implement it.

A small five-line screen will pop up at the bottom of the screen offering further choices or a blank screen for inputing text or numeric data.

If you get into the incorrect menu hitting escape will take you back to the spreadsheet.

A command line at the top of the screen gives details of instructions input for each cell. Details of free memory is also given.

Load/save screen gives options for formatting disks, and loading and saving you worksheets. You may save your worksheets as text files, which will allow for easy inclusion in Atariwriter or other word processing packages.

You may convert programmes from Visicalc to Syncalc. The transfer of data between Syncalc, Synfile and Syntrend is relatively easy.

The Options

The text mode allows you to enter text for headings for your Rows and Columns. These text names can be used to refer to cells rather than using A3 i.e. JAN-SALES.

Numeric allows you to enter numbers or formulae. Formulae may include any of the normal mathematical funnctions +-/* as well as absolute value, arc cosine, arc sine, arc tan, cosine, e to the power of, interger part of x, natural log of x, common log of x, pi, sine of x, square root of x, and tangent of x.

Logical functions include: if condition THEN x ELSE y, while special functions are included for: LOOKUP (X, range, offset), and financial functions allow for: mean, average, net present value, range, maximum and minimum.

While in the numeric window, pushing Option and Select will give you a list of functions available.

The sort function allows the sorting of ranges of cells into ascending or descending order – a very useful function.

Command selection allows you to manipulate the worksheet.

You may wish to change the width of a Row, insert or delete a column, protect a worksheet or part of a worksheet or change the format of a column or row.

A full list of available options is given inn a pop-up window. You move the cursor and the computer will lead you through the choices to be made for each option.

Once you get familiar with the options available you can bypass the menus at the bottom of the screen and enter direct commands, i.e. just start typing a letter to enter a label, while a number, @ sign or + will take you automatically to the numeric window.

To enter a command push the backslash key followed by the abbreviation for the command (C for copy).

When you are in the menu system the abbreviations are displayed in the command window as you make your choices, making the learning of abbreviations for frequently used commands easy.

Cells may be referenced in formulae and commands by entering the cell reference (A3) or by pointing to the cell (by placing cursor on the required cell).

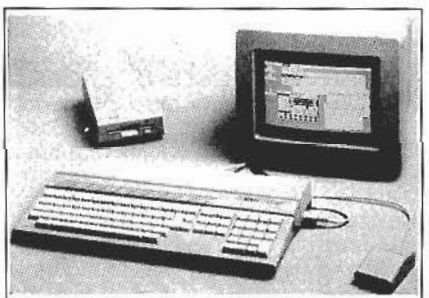
To print out a worksheet you are asked to define the range you wish to print out.

There is no way of storing this information in a macro (macros are not supported by Syncalc) so it can become tedious if you havve a lot of sections to be printed out separately. You may save all or part of the worksheet to disk for reference by other worksheets.

Memory space

One of the problems with electronic worksheets on home computers has been that once you get all the user friendly features required there is no memory left for the worksheet.

This is not a problem with the 130XE implementation of Syncalc – with 128 columns, 255 rows and 84K of free memory you can design very large worksheets.



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SURPRISE

See Inside
Front Cover

But it always pays to save annd reload your worksheet at regular intervals to avoid memory problems, partiocularly if you are using the sort feature.

Syncalc is a friendly, easy to use, well documented implementation of the electronic worksheet on the Atari.

Its uses are only limited by your imagination.

If you are having problems working out the best solution for your worksheet then any of the books of solutions written for other worksheet programs are easily converted to Syncalc.

Highly recommended to anyone with budgeting problems.

Synfile

A companion programme to Syncalc, Synfile is a database programme which allows you to organise information into relevant lists and files.

Synfile comes on disk with a tutorial on the reverse side of the disk. Friendly and easy to use pop-up menus lead you through the design and creation of your database. The manual leads you through a simple example.

To set up a database you have to create a file. A file is made up of fields which you are required to define.

For a record library they may be record title, performer, song and style.

It's over to you to include all the date you wish to include.

You should spend time working out the names and types of fields you wish to include in your data base for while it is possible to add new fields and change their format it can be tricky.

As you set up your fields you also design your input screen. Place the cursor where you want it on the screen and type the title. On hitting return you will be prompted for the type and length.

Fields may be TEXT, NUMERIC, LOOKUP (scrolls through defined choices), DOLLAR, DATE, INTERGER, CONDITIONAL (true or false check on comparison with other fields), COMPUTED (calculates the results of a formula that you specify), COUNTER and RECORD.

Having set up the data-base you may input data but first you will have to specify a key which may be on any field (or more than one).

This key determines the order in which data is stored and the smaller it is the more records you can have in the data base.

Having created a file you may sort it or search for information in any field by simply inputing the information you wish to search for in the blank form. You may make conditional searches (all with surname greater than G).

You may print out a database in the form of a list or label.

The list form allows you to place any field anywhere on a single line. Records are printed one under the other,.

In the labels form you may print the fields anywhere on the page.

The problem with printing in Synfile is you cannot save your print format. Each time you wish to print out your database you are required to reinput the print parameters.

This can be simplified by creating a simple label print file on disk and then reading the label file into a Atariwriter file. Mail merge is handled in a similar manner.

Items for printing may be selected from the data-base using search criteria on any field. This can be slow and it is often quicker to create a subfile of the information to be printed out and then printing out subfile in full.

Getting to knopw the idiosyncrasies of Synfile can be frustrating but once you master it it is an invaluable tool for recording, sorting, filing and retrieving related information – be it a mailing list or record collection.

Recommended to all, with patience and information to be sorted.

Syntrend

Syntrend is a package of two Atari Basic programes SynGraph and SynStat.

SynGraph allows you to input data and create graphs, Data may be transferred from Syncalc and Synfile. An easy to follow tutorial and pop-up menus lead you through the creation of line graphs, scatter graphs, bar sharts and pie charts.

You may save the graphs to disk and project them as a slide show. If you have a dot matrix printer you may print them out.

Synstat allows you to analyse information; once again you can input your own data or transfer it from Syncalc or Synfile.

Describe will analyse the data giving the following statistical information: number of objects, average, standard deviation, variance, standard error, minimum, maximum, range.

You may then carry out regression analysis both dependent and independent.

Synstat and Syngraph are of interest to those with a interest in statistics and statistical analysis, or who have a requirement to create graphs.

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Three programme constructs

by Craig Beaumont

The benchtest for Dr Logo in the last issue may be a little unfair at 134 seconds. This was on the CP/M 2.2 version of Logo, which is a partial implementation of this language when compared to the CP/M Plus version.

This version recorded a time of 122 seconds.

Also on the language front Oxford Pascal is now available on the 6128 and Digital Research have released compilers called PASCAL/MT+ and CBASIC – good to see such a high powered establishment on the Amstrad software scene.

* * * * *

This month we will dissect a program virtually line by line. My experience in the users group indicates a large proportion of you may be interested in this.

The program is a reaction tester – not especially useful but it contains many aspects of Basic programming.

The aim is to post a record time or break the record average. To play the game press any key as quickly as possible when you hear the beep. The program checks for various methods of cheating – holding down or tapping of keys, and rewards those who do with the dismal reaction time of 1 second.

All programs, whatever their language are, can be built from three constructs – sequence, selection and iteration.

Sequence means a series of steps executed (done not killed) in the order your machine finds them. An example of this is lines 10-90 where the reaction test program sets up the initial status of the random number generator, the variables we don't want to be zero and the screen.

Line 180 contains an example of the second type of construct – selection.

Here the program makes a decision on whether you have cheated. If you reaction time is less than 0.1 of a second then it decides you have been naughty and changes your time to 1 second.

At line 100 we find one of two types of iteration found inj the program. The FOR-NEXT loop here repeats the sequence in line 120-240 five times. In this sequence we find another FOR-NEXT loop on line 130. The function of this "nested loop" is to delay the beep for a random time.

The second type of iteration is the WHILE-WEND loop in line 160. This type of loop has no set number of repetitions. It keeps going while the conditions "no keys have been pressed" and "time elapsed since the loop started is less than 1 second" are true.

You can see that the WHILE-WEND loop is a mixture of iteration and selection as it makes a decision each loop on whether to loop again.

The program relies heavily on the TIME function.

While this is acccurate to 1/300th of a second the computer only scans the keyboard every 1/50th of a second – this is the limit to the accuracy of our reaction measurements.

As we want to print the various times quite often the program has a special routine for doing this.

The GOSUB 300 found throughout the program makes execution jump to line 300. Here the time is printed in the appropriate place then execution returns to the line after the one that caused the jump.

The CALL & BB18 in line 280 executes a firmware routine that pauses until a key is pressed. SPACE$(23) is a string of 23 space characters to blank the "Press a key to continue" prompt.

There are a few other features to this program – SOUND, PRINT USING and CLEAR INPUT, which the manuals explain in detail if you are interested.

You might like to add a feature where record breakers can input their name next to their achievement, or any other refinements you can think of. The program could be used to prepare for that high action game or perhaps monitor the condition of partygoers as they progress through the evening!

* * * * *

Talking of high action games none I have seen comes close to Starion by Melbourne House. It combines the fastest 3D vector graphics with the unscrambling of anagrams related to various events in the history of the earth.

The result is an experience requiring coordination and mental agility of the highest level. In my case the latter came from phone calls to a crossword exponent.

* * * * *

Keith and Norman Wansbrough of Auckland have sent in a program that is great for someone wanting to use their Amstrad and printer like one of those typewriters with the one line memory,.

They also ask when they can expect to see some CP/M software come out for the 464/664.

Most CP/M software I have seen advertised so far requires the extra memory as found on the 6128 – an exception is Hisoft's C which has versions for Amsdos, CP/M 2.2 and CP/M Plus all in the one package. Program follows.

```
10 REM Reaction Tester
20 REM initialise
30 RANDOMIZE TIME
40 MODE 1:rec=1:recav=1
50 LOCATE 1,10
60 PRINT "Reaction time:"
70 PRINT "Record time:"
80 PRINT "Average time:"
90 PRINT "Record average:"
100 REM main loop
110 total=0:FOR j=1 TO 5
120 LOCATE 1,9:PRINT"Attempt";j
130 FOR i=1 TO 1000+RND*4000:NEXT i
140 CLEAR INPUT:'664 & 6128 only
150 SOUND 1,40,4,15:a=TIME
160 WHILE INKEY$="" AND TIME-a<299:
    WEND:b=TIME
170 react=(b-a)/300
180 IF react<0.1 THEN react=1
190 total=total+react:aver=total/j
200 IF rec>react THEN rec=react
210 REM record reporting
220 y=10:s=react:GOSUB 300
230 s=rec:GOSUB 300
240 s=aver:GOSUB 300:NEXT j
250 IF recav>aver THEN recav=aver
260 s=recav:GOSUB 300
270 PRINT"Press a key to continue"
280 LOCATE 1,14:CALL &BB18
290 PRINT SPACE$(23):GOTO 110
300 LOCATE 16,y:y=y+1
310 PRINT USING "#.####";s:RETURN
```


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Pitfalls in buying second-hand

by Gary Parker

I've had a few calls lately from people wanting to know about any pitfalls involved in buying second-hand Spectrums. So this month I'll take a look at the practical side of owning a Spectrum – the things that can go wrong and how to avoid them.

As with all home computers, the Spectrum is a tough piece of equipment compared to the computers of a dacade ago. But that doesn't mean that you can treat it like a toaster – computers are tough compared to their predecessors, but still quite delicate when compared to most home appliances.

You can't leave a Spectrum in the garage and let it freeze, or leave it in the glasshouse and roast it, without having some problems.

One person I spoke to complained that the metal sheet on his Spectrum kept coming loose. He had taken his computer back to the shop and obtained a replacement several times, but each time the same fault had occurred.

It turned out that he kept his computer on the window sill in the sunroom, and the heat of the sun had been enough to melt the glue holding the metal down. With that amount of heat it is surprising that the computer kept functioning!

Shock treatment

People who put their computer away when they are not using it sometimes throw the computer around a bit. Computers are quite sensitive to shock, and although I have seen Spectrums take a big fall and survive, sometimes a little knock can upset them.

Also, don't operate a Spectrum while it is sitting in its polystyrene box, since static electricity can build up. One person I knew was using his Spectrum in a cut-down version of the box (to "protect it"), and found that the computer kept crashing. As soon as he used it without the box, all was well.

Take care not to press the keys absurdly hard when playing games. The Spectrum keyboard has two sheets of thin plastic below it. Each sheet has a circuit printed on it which forms a grid beneath the keys. Each key has a buble in the plastic below it, and when you press a key, the buble is squashed and the two circuits touch and so register the keypress.

This system can work for a long time, but if you press certain keys really hard, the circuit eventually cracks, with the result that the key will not register when you press it.

If you are buying a second-hand Spectrum which looks fairly well used, it would be a good idea to press every key and check that it registers on the screen. Of course, some keys such as SHIFT will not produce anything unless you press another key as well.

Worn tracks

The backplane of the Spectrum (the bit that interfaces are connected to) wears out if accessories are pulled on and off a lot. Once the circuit tracks are worn, they are difficult to fix unless you carefully apply solder to each track.

The tracks may also become tarnished and so unconductive. Tracks should really be made of gold, but to save money are often made of other metals, as on the Spectrum. So you should clean them occasionally with a little spirits.

The backplane is directly connected to the chips inside the computer. Since chips are sensitive to static, you should take care when touching the backplane.

I've never taken any particular precautions and have not had any trouble, but one person at the local computer club managed to fry most of the chips in a Spectrum by touching the backplane.

Be careful if you have nylon carpets, since static builds up very easily in nylon.

When Sinclair made the first digital watches, the executives who could afford them tended to have nylon carpet in their offices. The watches couldn't take it, and Sinclair gave up producing digital watches.

Changing channels

Some Spectrums may give pictures of varying quality depending on where they are used. When I first got a Spectrum, it gave a ghastly picture at home, but worked perfectly when I took it back to the shop.

It turned out that the signal given out by the computer was close to channel three, the channel used by Television One. My home was near a TV transmitter, and the TV signal interfered with the picture.

I had to alter the position of the computer's signal. To do this, take your computer to a shop or to someone who has done it before, or do it yourself if you feel up to it.

First you have to carefully open the computer – take care not to stretch the keyboard printed circuit strips – and locate the modulator. This is a metal box, about the size of a matchbox, at the back of the spectrum.

In the top is a small hole through which can be seen a tuning slug. You should turn this slightly with a screwdriver, while watching the picture on the screen.

Stop turning when the picture has moved to the channel you want.

I moved mine to channel two, which is only a small turn of the slug.

It is best if you use a non-metallic screwdriver, since a metal screwdriver will alter the tuning when you touch the slug. But if you have any doubts about your ability to perform this task, leave it to the experts.

Faded keys

Older Spectrums (not the Spectrum Plus) often have faded lettering on the keys. The red ink in particular can start to rub off with constant use.

The Spectrum keys are joined together beneath the metal plate to form a single rubber mat. This mat can be replaced reasonably inexpensively. A shop will do it for you, but if you manage to obtain a mat you can do it yourself.

You have to peel off the metal plate (which is stuck down with fairly strong double-sided tape), lift out the rubber mat, and lie the new one in place. Then stick down the metal plate again (the tape will probably still be sticky enough). That's all there is to it.

If you're buying a second-hand Spectrum, check out the things mentioned above, where applicable, and look at the overall appearance of the computer. Does it look clean? Are there no signs of fluid spills or tampering? Is it treated with respect by the owner?

Apart from these external things there is little else you can do to evaluate a computer. Obviously, you should see it going.

If possible, get the owner to load a commercial game into the machine, since these tend to use the computer to iats fullest.

If a second-hand computer works properly when you buy it, the chances are that it will work properly for some time to come. Spectrums tend to develop a fault within a week or so of being purchased new, or not for many years.

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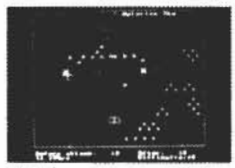

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